

Annelida Polychaeta from the Philippines and Indonesia

by

T. GOTTFRIED PILLAI

Department of Fisheries, Colombo, Ceylon.

(With twenty-four text-figures)

Besides Grube's (1878) classic work *Annulata Semperiana* there have been no major studies on Philippine polychaetes and other references to Philippine polychaetes (Treadwell 1920, 1942, 1943, etc.) are very few. The Polychaeta of Indonesia are practically unknown. The present paper deals with a collection of marine and brackish-water polychaetes made from the Philippines and Indonesia during the period April to October 1960. Thirty-three species are reported, including two genera, fourteen species and three varieties new to science, five new to the fauna of the Philippines and two new to the fauna of Indonesia. The marine species were collected from the Lingayan Gulf and Manila Bay in Luzon, Philippines. The brackish-water species are from oyster and milkfish (*Chanos chanos* Forskal) farms in the Philippines and from milkfish farms in East Java and the island of Madura in Indonesia.

List of species :

APHRODITIDAE	<i>Hermonia hystrix</i> (Savigny) <i>Pontogenia lichaucoi</i> sp. nov.
POLYNOIDAE	<i>Lepidonotus carinulatus</i> (Grube) <i>Lucopia magnicirra</i> gen. et. sp. nov. <i>Harmothoe ampullifera</i> (Grube)
AMPHINOMIDAE	<i>Eurythoe complanata</i> (Pallas) <i>Notopygos variabilis</i> Potts <i>Pherecardia striata</i> (Kinberg)
HESIONIDAE	<i>Bonuania parva</i> gen. et sp. nov.
SYLLIDAE	<i>Parautolytus luzonensis</i> sp. nov. <i>Eusyllis edenticulata</i> sp. nov.
NEREIDAE	<i>Dendronereis pinnaticirris</i> Grube <i>Namalycastis rigida</i> sp. nov. <i>Neanthes negomboensis</i> de Silva <i>Neanthes manatensis</i> sp. nov. <i>Neanthes bongcoi</i> sp. nov. <i>Leonnates decipiens</i> Fauvel, var. <i>manilensis</i> nov.
EUNICIDAE	<i>Eunice antennata</i> Savigny <i>Marphysa gravelyi</i> Southern
SPIONIDAE	<i>Polydora cavitensis</i> sp. nov.

CIRRATULIDAE	<i>Cirriformia chrysodermoides</i> sp. nov.
OPHELIIDAE	<i>Polyophthalmus pictus</i> (Dujardin)
CAPITELLIDAE	<i>Branchiocapitella singularis</i> Fauvel
TEREBELLIDAE	<i>Thelepus binakayanensis</i> sp. nov. <i>Terebella ehrenbergi</i> Grube
SABELLIDAE	<i>Branchiomma cingulata</i> (Grube) <i>Megalomma intermedium</i> (Beddard) <i>Potamilla ocula</i> sp. nov.
SERPULIDAE	<i>Hydroides grubei</i> sp. nov. <i>Hydroides norvegica</i> Gunnerus <i>Pomatoleios kraussii</i> (Baird) var. <i>manilensis</i> nov. <i>Neopomatus uschakovi</i> Pillai, var. <i>lingayanensis</i> nov. <i>Neopomatus uschakovi</i> Pillai <i>Spirorbis (Dexiospira) treadwelli</i> sp. nov.

Eurythoe complanata, *Notopygos variabilis*, *Pherecardia striata*, *Marphysa gravelyni*, *Terebella ehrenbergi* and *Megalomma intermedium* are new to the fauna of the Philippines. *Dendronereis pinnaticirris*, *Branchiocapitella singularis* and *Neopomatus uschakovi* are new to the fauna of Indonesia.

The type specimens of the species new to science have been deposited in the Department of Zoology, University of Ceylon, Peradeniya, Ceylon, and paratypes have been deposited in the British Museum (Natural History).

ACKNOWLEDGMENTS

It is my pleasant duty to express my gratitude to the following: Professor Hilary Cruz of the Department of Zoology, University of Ceylon, for his encouragement and help in many ways without which the study of this collection would not have been possible; Dr. K. D. Arudpragasam and Dr. A. M. Ladduwahetty of the Department of Zoology, University of Ceylon, for their invaluable assistance; Dr. P. H. D. H. de Silva of the National Museum, Colombo, for loaning me several references on the Polychaeta and his collection of *Eurythoe complanata* (Pallas), *Namalycastis meraukensis* (Horst), *Namalycastis indica* (Southern), *Branchiocapitella singularis* Fauvel and *Potamilla leptochaeta* Southern; and Dr. William E. Old, Jr. of the American Museum of Natural History, New York, for a Xerox copy of Grube's (1878) *Annulata Semperiana*.

My grateful thanks are also due to the Food and Agriculture Organization of the United Nations for sponsoring the six month Fellowship studies on fish farming methods (Pillai, 1962) during which this collection was also made; to Mr. Jose M. Lichauco of Lucop, Alaminos, Pangasinan, Luzon, for the collection of specimens from Hundred Islands, Lingayan Gulf; to Mr. Eugenio Bongco of the Bureau of Fisheries, Dagupan City, for making arrangements for the collection of specimens from Bonuan and Manat, Dagupan

City; to Mr. Gregorio L. Escritor of the Bureau of Fisheries, Manila, for making arrangements for the collection of specimens from the oyster farm at Binakayan, Cavite, Manila Bay, and to Mr. Ernesto P. Bernabe of the Bureau of Fisheries, Dagat-dagatan for the specimens of *Hydroides norvegica* Gunnerus.

Family **APHRODITIDAE** Malmgren, 1867

Sub-family **HERMIONINAE** Darboux, 1899

Genus **HERMONIA** Hartman, 1959

The name *Hermonia* was proposed by Hartman (1959) to replace *Hermione* Blainville (1828) which was preoccupied.

Hermonia hystrix (Savigny), 1820.

Hermonia hystrix (Savigny)

Hartman 1959, p. 56; Imajima and Hartman 1964, p. 15.

Hermione hystrix (Savigny)

Fauvel 1923, p. 35; Fauvel 1932, p. 10; Fauvel 1953, p. 28, Fig. 10, a—k; Tebble 1955, p. 73.

Hermione malleata Grube, 1878.

Grube 1878, p. 17; Willey 1905, p. 245.

One specimen was collected by Mr. Lichauco from Hundred Islands, Lingayan Gulf, Luzon. It is 25.0 mm. long and 13.0 mm. wide (including setae). Eggs are present under the elytra.

Distribution.—The Philippines, Indo-Malaysian Region, Nankauri, Nicobar Islands, Ceylon, India, Atlantic, Mediterranean, Red Sea.

Genus **PONTOGENIA** Claparède, 1868

Pontogenia lichaucoi sp. nov.

(Fig. 1, A—G)

One specimen was collected from Hundred Islands by Mr. Lichauco. Length 22.0 mm; width 6.0 mm. in the middle of the body, including setae. Total number of setigers 35.

The body is not oval but somewhat elongate, with the posterior end slightly broader than the rest of the body. The ventral surface of the body and the feet are covered with small papillae.

The pair of palps (Fig. 1, A) end in somewhat clavate tips and are beset with microscopic papillae. The median tentacle is slender and three-jointed. Its basal joint is conical and covered with conspicuous papillae. The terminal segment is smooth and the

intermediate segment, which is the longest, is covered with minute papillae. Two pairs of eyes are present, the two eyes on each side being borne on a globular ommatophore. The anterior pair is larger than the posterior pair.

The back is covered by a dorsal felt. Below it there are *fourteen pairs of elytra* on the following setigers :— 4, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 28 and 31. They are smooth, more or less circular and transparent.

The first foot (Fig. 1, B) lacks stout dorsal and ventral setae but possesses slender felt-like processes dorsally and slender setae ventrally. An aciculum is present in the dorsal ramus. The dorsal and ventral cirri are two-jointed. Their distal joints are smooth and end in a translucent terminal sub-division. Their elongated proximal joints are covered with microscopic papillae and the cirrophores are covered with conspicuous papillae.

In the second foot (Fig. 1, C), felt-like dorsal setal processes are present. Above and below the aciculum there are stouter capillary bristles. In the ventral ramus, towards its middle, there are two simple, stout yellowish setae with bidentate tips (Fig. 1, D). More ventrally, there are about 15 bright yellow setae with pouch-like lateral processes arranged in two longitudinal rows (Fig. 1, E).

The third foot is similar to the second except that setae of a different kind are present in the dorsal ramus. They possess minute triangular tubercles arranged in two longitudinal rows along one side of the somewhat flattened seta (Fig. 1, F & G), the tubercles of one row alternating with those of the other.

From the fourth foot backwards setae with pouch-like lateral processes (Fig. 1, E) are absent and only setae with bidentate tips are present in the ventral ramus. The stout dorsal setae which pierce the felt are somewhat broader, golden yellow in colour and point backwards.

This species is superficially very similar to *Pontogenia indica* Grube 1878 in possessing a dorsal felt but the latter species has 18 pairs of elytra and 43—45 setigerous segments (Fauvel, 1953). *P. mcIntoshi* Monro 1924, *P. laeviseta* Hartman and *P. maggiæ* Augener 1906 have 15 pairs of elytra arranged on setigers 2, 4, 5, 7.....21, 23, 25, 27, and 29. *P. nuda* Horst 1917 also possesses 15 pairs of elytra but lacks a dorsal felt. Fauvel (1953) feels that *P. chrysocoma* (Baird) 1865, may only be variety of *P. nuda*.

In the present species, *P. lichaucoi*, however, a dorsal felt is present and there are only 14 pairs of elytra. The second setiger lacks elytra and the arrangement of the posterior elytra is on setigers 21, 23, 25, 28 and 31, unlike in the other species.

Type specimen : Holotype. University of Ceylon, RTS. 13.

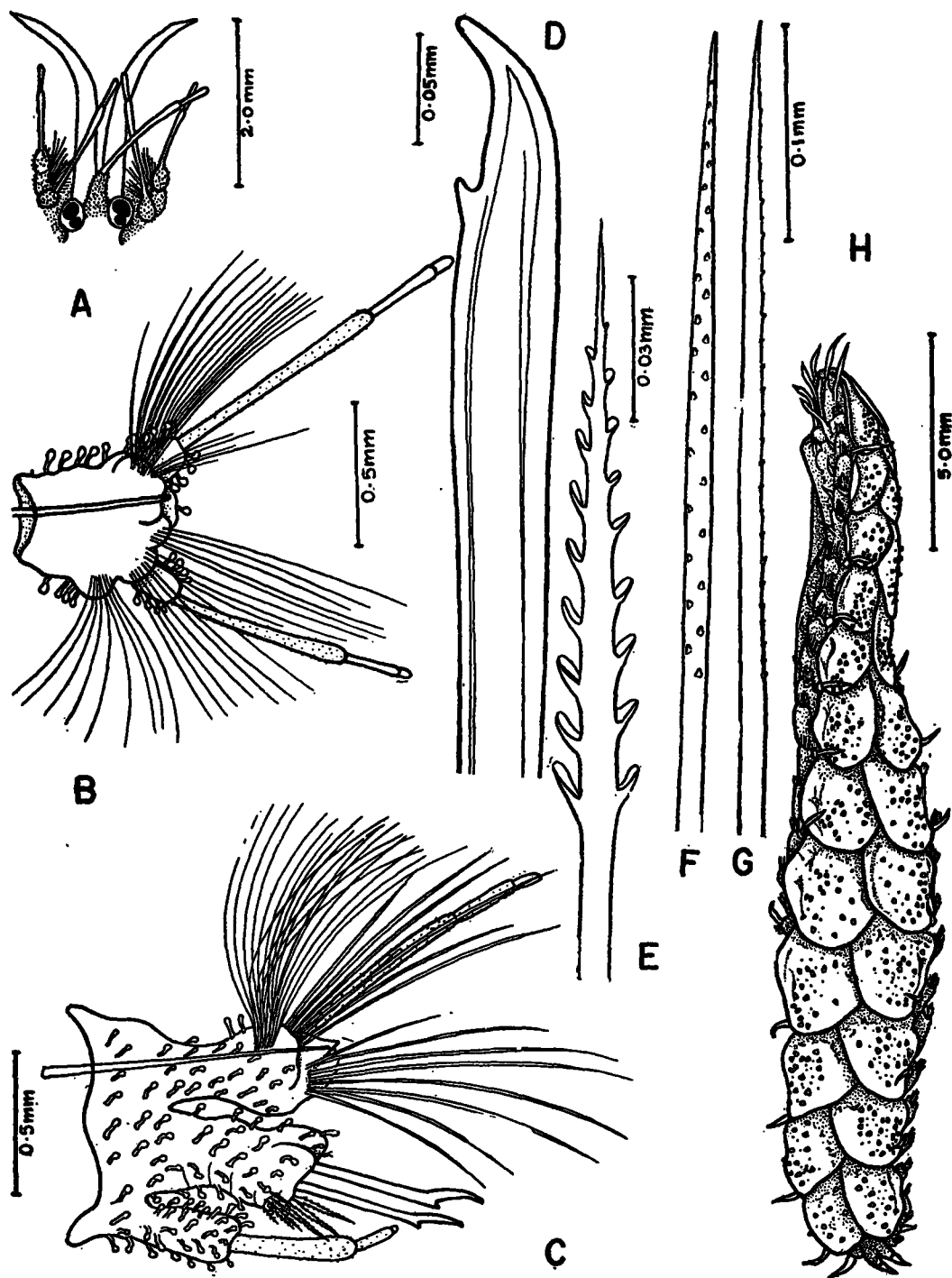


FIGURE 1. *Pontogenia lichaucoi* sp. nov., A—G. A, Dorsal view of anterior end; B, Anterior view of 1st left foot; C, Anterior view of 2nd left foot; D, Bidentate ventral seta from a posterior foot; E, Ventral seta with pouch-like lateral processes, from the 3rd foot; F, Dorsal seta from the 3rd foot, viewed from the toothed edge; G, Dorsal seta from the 3rd foot, in side view; H, *Lepidonotus carinulatus* (Grube), whole worm.

Family POLYNOIDAE Malmgren, 1867

Genus LEPIDONOTUS Leach, 1816

Lepidonotus carinulatus Grube, 1870.

(Fig. 1, H; Fig. 2, A-F)

Lepidonotus carinulatus (Grube)

Fauvel 1953, p. 34, Fig. 13, g-i; Fauvel 1932, p. 13;

Willey 1905, p. 248, pl. 1, Figs. 7-11.

Polynoe (Lepidonotus) carinulata Grube

Grube, 1878, p. 26, Taf. III, Fig. 2.

Three specimens were collected from the oyster farm at Binakayan, Cavite (Manila Bay), Luzon. One of them was found living commensally within the tube of *Thelepus* described later in this paper. It is 20.0 mm. long and 4.0 mm. wide.

The body (Fig. 1, H) is short and has 26 setigers. Twelve pairs of elytra are inserted on setigers 2, 4, 5, 7, 9.....19, 21, 23. The elytra (Fig. 2, A) are firmly attached, slightly fringed in this specimen, and bear tubercles on their upper surfaces. A dark brown pigment patch is present on each elytron.

The prostomium (Fig. 2, B) is bilobed and has 4 eyes. The two lateral tentacles are terminal. The median and lateral tentacles and the dorsal and ventral cirri have clavate tips.

The dorsal setae (Fig. 2, C) are pale yellow and possess curved, plate-like teeth. When viewed from the blunt edge they appear as a double row (Fig. 2, D). The ventral setae (Fig. 2, E & F) possess bidentate tips and, at some distance below the tip, there is a transverse row of triangular teeth. The latter is followed by 5-6 transverse row of smaller teeth which become progressively smaller, further away from the tip of the seta.

Distribution :— The Philippines, Japan, Indian Ocean, Ceylon, Madagascar, Persian Gulf, Red Sea.

LUCOPIA Gen. nov.

Body short. Prostomium bilobed. Four eyes. Lateral tentacles inserted terminally. Fourteen pairs of elytra inserted on setigers 2, 4, 5, 7, 9.....23, 25, 27. Non-elytrygerous setigers 3, 6, etc., bear enlarged cirrophores and swollen dorsal cirri. Notopodia poorly developed, with only an aciculum. Neurosetae stout, with bidentate tips.

The genus differs from the other polynoid genera with regard to the number of elytra and the arrangement of the posterior elytra. *Drieschia* Michaelsen 1892 and *Podarmus* Chamberlin 1919 have the closest resemblance to this genus. In *Drieschia*, the tentacles are inserted terminally and the cirrophores are swollen. But the number and arrangement of its scales and the ventral setae are different from the present genus. *Podarmus*, like the present genus, has 14 pairs of elytra but their arrangement is different. They are situated on setigers 2, 4, 5, 7.....21, 23, and then 26 and 29, unlike in the present genus.

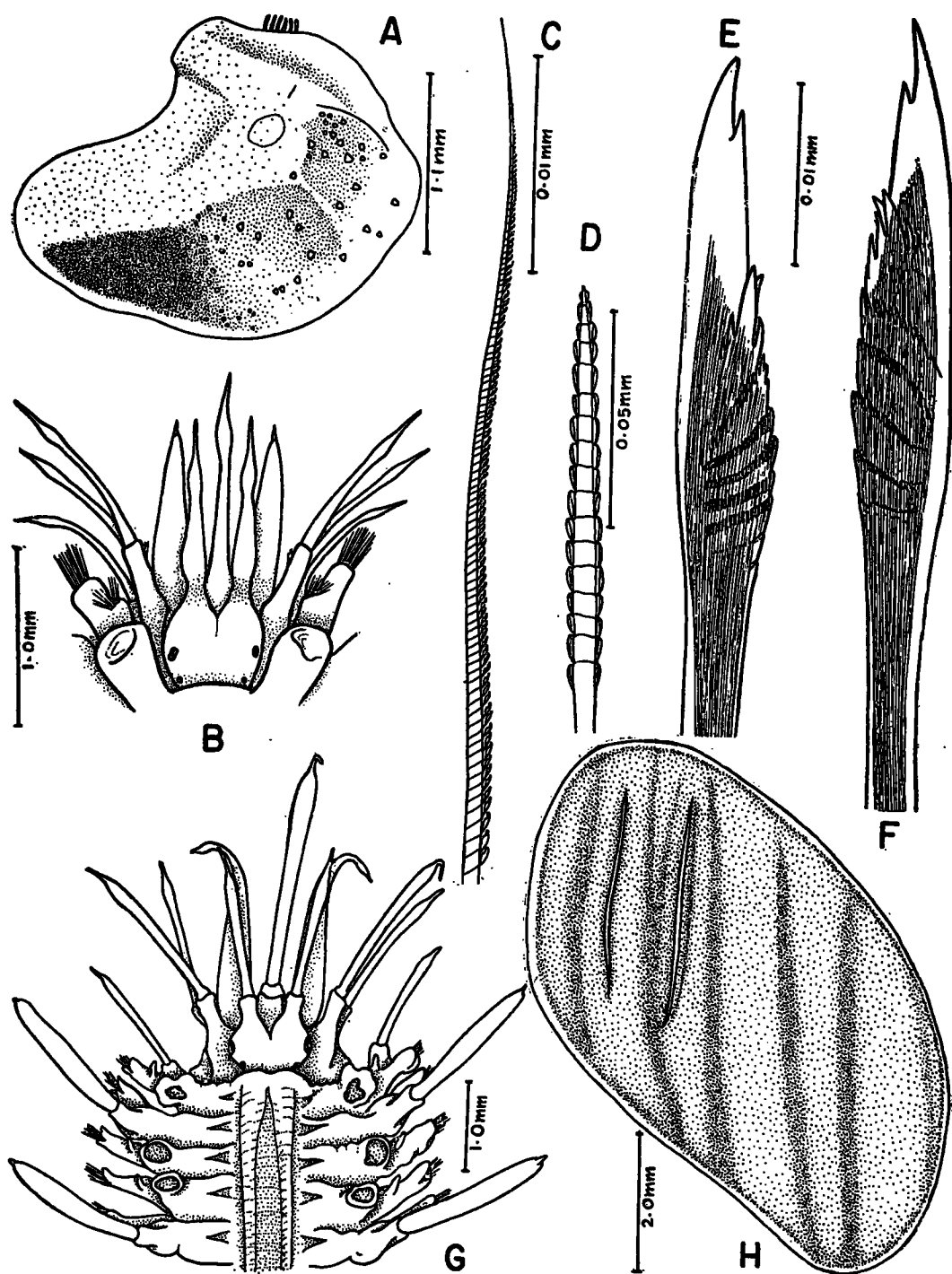


FIGURE 2. *Lepidonotus carinulatus* (Grube), A—F. A, 3rd right elytron; B, Anterior end; C, Dorsal seta from the 5th foot; D, Dorsal seta viewed from the blunt edge; E, F, Ventral seta from the 5th foot. *Lucopia magnicirra*, gen. et. sp. nov., G—H. G, Anterior end; H, An elytron.

***Lucopia magnicirra* sp. nov.**
(Fig. 2, G—H; Fig. 3, A—C)

This species is taken as the type for the genus.

One specimen was collected from Hundred Islands by Mr. Lichauco. It is 30.0 mm. long, 9.0 mm. wide (including setae) and has 27 setigers. Its anal segment is missing and only one elytron is present.

The prostomium (Fig. 2, G) is bilobed and has 4 eyes. The lateral tentacles are inserted terminally. The pair of palps are stout. There are two pairs of tentacular cirri. The median and lateral tentacles, the palps and the tentacular cirri possess clavate tips.

The dorsal body wall is raised into a longitudinal muscular ridge which is more conspicuous anteriorly. On either side of it there is, in each setiger, a triangular depression. There are 14 pairs of elyrophores on the following setigers: 2, 4, 5, 7, 9, 21, 23, 25 and 27. The elytra (Fig. 2, H) are not fringed and lack papillae or other outgrowths. There are, however, two longitudinal ridges and about 5 longitudinal dark grey stripes. The setigers without elytra, 3, 6, 8, etc., bear enlarged cirrophores (Fig. 2, G) which carry swollen dorsal cirri. The latter end in a small papilla.

The first foot has the longest ventral cirrus. The ventral cirri of the second and succeeding feet become progressively shorter. Below each ventral cirrus, from the 7th setiger backwards, there is a rounded swelling from which arises a postero-laterally directed tube-like process.

The dorsal rami of the feet (Fig. 3, A) are reduced, there being only a yellow aciculum and two small rounded flap-like lobes. The ventral rami have two prominent rounded flap-like lobes; one is anterior and the other posterior. It also bears a yellow aciculum. The setae (Fig. 3, B & C) of the ventral rami possess two longitudinal rows of pouch-like serrations and end in bidentate tips. The latter teeth are rounded and blunt. The subterminal tooth is much smaller than the terminal one; it is sometimes broken or may be represented by a slight swelling.

Type specimen: Holotype. University of Ceylon, RTS. 14.

Genus **HARMOTHOE** Kinberg, 1855

***Harmothoe ampullifera* (Grube) 1878**

(Fig. 3, D—G; Fig. 4, A & B)

Harmothoe ampullifera (Grube)

Fauvel 1953, p. 43, Fig. 18, d.

Polynoë ampullifera Grube

Grube 1878, p. 35, Pl. III, Fig. 5.

Two specimens were found among oysters at the oyster farm in Binakayan, Cavite City, Manila Bay. The larger specimen is 33.0 mm. long, 12.0 mm. wide (including the setae) and possesses 40 setigers. The pair of anal cirri are 6.0 mm. long.

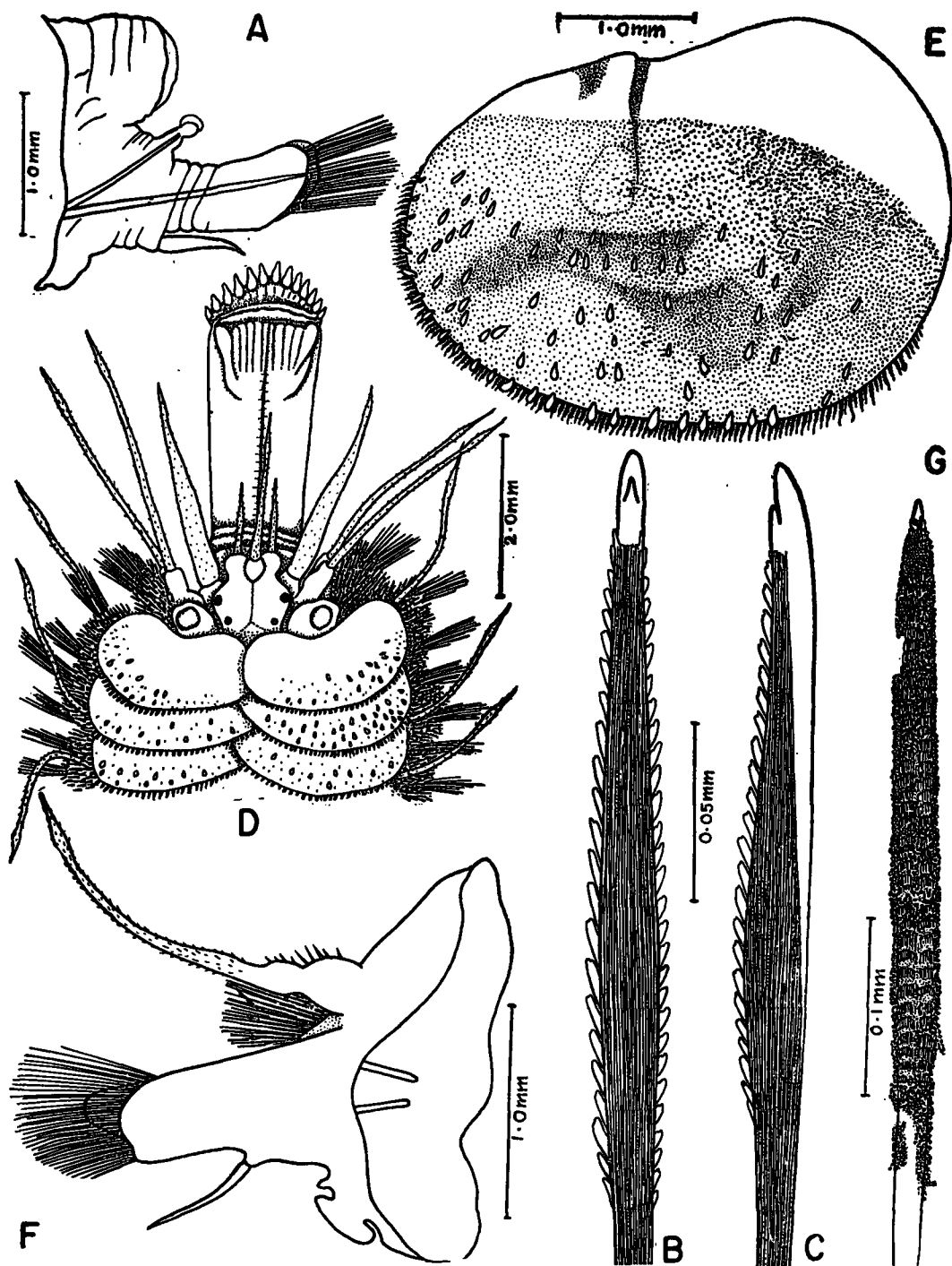


FIGURE 3. *Lucopia magnicirra*, gen. et. sp. nov., A—C. A, 8th right foot, posterior view; B, C, Ventral setae, viewed along the edge and side, respectively. *Harmothoe ampullifera* (Grube), D—G. D, Anterior end, with 1st pair of elytra removed; E, An elytron; F, Posterior view of 6th left foot; G, A dorsal seta from the 6th foot.

The prostomium (Fig. 3, D) is bilobed and bears four eyes. The lateral tentacles are inserted ventral to the median tentacle. The median tentacle is shorter than the palps and the lateral tentacles are shorter than the former. The palps are stout and end in clavate tips. They are beset with microscopic papillae. The median and lateral tentacles, the 2 pairs of tentacular cirri are covered with longer papillae. The tentacular cirri and dorsal and ventral cirri are long, slender and end in slightly swollen, tapering tips. The everted proboscis (Fig. 3, D) has a row of 13 soft pyriform papillae, dorsally.

There are 15 pairs of deciduous elytra inserted on setigers 2, 4, 5, 7, 9,.....21, 23, 26, 29 and 32. Setigers 33-40 are without elytra. The elytra (Fig. 3, E) are somewhat reniform, fringed and bear hyaline vesicular papillae both along the posterior border and dorsally.

The dorsal and ventral rami of the feet (Fig. 3, F) are well developed. The dorsal setae (Fig. 3, G) have unidentate tips and pouch-like serrations arranged in two longitudinal rows. These serrations are in turn minutely denticulated. The light yellow ventral setae (Fig. 4, A & B) also possess two rows of pouch-like serrations which are in turn minutely serrated. They end in bidentate tips, the sub-terminal tooth being slender and reaching or slightly extending beyond the terminal tooth.

Ventrally, from the 4th setiger backwards, there is on each setiger, a pair of semilunar locomotory lamellae (Fig. 3, F), which are provided with special muscles.

Distribution.—The Philippines (Bohol, Manila Bay), India, Persian Gulf and Red Sea.

Family AMPHINOMIDAE Savigny, 1818

Genus EURYTHOË Kinberg, 1857

Eurythoë complanata (Pallas) 1766.

(Fig. 4, C—E)

Eurythoë complanata (Pallas)

Fauvel 1953, p. 83, Fig. 38, b—m; Chamberlin 1919, p. 252; Day 1951, p. 6; Day 1962, p. 635; Fauvel 1919, p. 348; Fauvel 1932, p. 45; Fauvel 1958, p. 19; Hoagland 1919, p. 576; Imajima and Hartman 1964, p. 51; Monro 1924, p. 70; Monro 1927, p. 252; Monro 1931, p. 27; Monro 1933, p. 4; Potts 1909, p. 367; Rioja 1954, p. 224; Tebbble 1959, p. 17; Willey 1905, p. 245.

Eurythoë latissima Schmarda, Willey 1905, p. 245.

Amphinome indica, Schmarda 1861, p. 142.

Amphinome longicirra, Schmarda 1861, p. 142.

Amphinome macrochaeta, Schmarda 1861, p. 144.

Amphinome eupochaeta, Schmarda 1861, p. 143, pl. 35, Fig. 293.

One specimen was collected by Mr. Lichauco from Hundred Islands. It is 65.0 mm. long, 10.0 mm. wide and possesses seventy setigers.

In this specimen, the four eyes are hidden and not conspicuous. The caruncle terminates on the anterior part of the 4th setiger; its lateral lobes are not very clear since they are hidden under the smooth lobe. Ventrally, the mouth extends up to the 5th setiger. Gills commence on the second setiger and extend to the end of the body.

Notosetae are variable in length and are typically of three kinds: (i) Long calcareous setae with an elongated slender tip, more or less serrated and with a spur at the base. (ii) The large, harpooned, glochidiate setae with lateral rows of easily deciduous teeth could not be found in this specimen. As stated by Fauvel (1953), these setae could have been damaged by the preservative owing to their calcareous nature. (iii) Smooth, stout, somewhat flattened setae which are curved (Fig. 4, D).

The neurosetae are of two kinds. (i) stout furcate setae with yellowish-brown tips. The latter have two unequal arms (Fig. 4, E). (ii) A few sub-furcate setae with one of the arms thin and greatly elongated (Fig. 4, C). The acicula are short and spear-shaped.

Distribution :—The Philippines, Mergui, Andaman Islands, India, Ceylon, Maldives, Arabian Sea, South Africa, Gold Coast, Israel, Mexico, Panama, Porto Rico, Galapagos.

Genus **NOTOPYGOS** Grube, 1855

Notopygos variabilis Potts, 1909

Notopygos variabilis Potts.

Potts 1909, p. 360, pl. XLV, Fig. 9; Fauvel 1932, p. 58; Fauvel, 1953, p. 100.

Two specimens from Hundred Islands collected by Mr. Lichauco. The larger specimen is 37.0 mm. long and has 32 setigers. The other specimen has 29 setigers.

These specimens agree with the description given by Fauvel (1953) in most respects. However, the smooth area separating the folded regions of the caruncle is not pigmented; this is probably due to discoloration in the preservative. The caruncle extends to the 5th setiger in the larger specimen and the 4th setiger in the other. Four eyes are present, the anterior pair being larger. Dorsal setae agree with Fauvel's description but the ventral setae do not show any serrations. The anus is preterminal, situated on the dorsal aspect of the 23rd setiger. The variations observed seem to be within the range possible in this species.

Distribution.—The Philippines, Nakkauri Harbour, Nicobar Islands, Andaman Islands, Maldiv Islands.

Genus **PHERECARDIA** Horst, 1886**Pherecardia striata** (Kinberg) 1857

(Fig. 4, F-H)

Pherecardia striata (Kinberg)

Monro 1924, p. 72; Day 1957, p. 67.

Three specimens were collected from Hundred Islands by Mr. Lichauco. The largest specimen is an anterior fragment 150.0 mm. long and 14.5 mm. wide in the widest region. It has eggs floating in the coelom. The second specimen is 80.0 mm. long, 12.0 mm. wide and has 70 setigers. The third specimen is 70.0 mm. long, 11.0 mm. wide and has 74 setigers.

The body is soft and smooth. It is rectangular in cross-section. The prostomium (Fig. 4, F) has 4 eyes. The median tentacle arises between the posterior pair of eyes, just anterior to the median caruncular ridge. The caruncle extends up to the 6th setiger in all three specimens. Typically, it has a median ridge or rachis and lateral lamellae, the latter in turn possessing lateral folds on either side. The median ridge is somewhat cordate at its origin from the posterior border of the prostomium, in two specimens. In the third specimen, the anterior cordate enlargement is tucked in on its ventral side and is flap-like and somewhat isolated from the median ridge underneath. The first pair of lateral lamellae of the caruncle arise under the postero-lateral regions of the prostomium. The others, eight on either side, arise from the median ridge itself.

The dorsal surface of the body is furrowed into small rectangular or square areas, the furrows themselves being pigmented brown, particularly in the anterior segments.

Gills commence on the first setiger (Fig. 4, G) which has simple capillaries in both dorsal and ventral rami. In the remaining feet (Fig. 4, H), the gill filaments and ventral setae are more numerous. No harpoon-shaped setae are present in the notopodia, probably because the barbs may have been destroyed by the preservative. Neuropodial setae are all slender capillaries.

Distribution.—The Philippines, Society Islands, South Africa.

Family **HESIONIDAE** Malmgren, 1867**BONUANIA** Gen. nov.

Prostomium bilobed. Two pairs of eyes. Lateral tentacles absent. Median tentacle reduced. Two biarticulate palps. Four pairs of tentacular cirri (total 8). Dorsal ramus of the foot reduced to a cirrus and a few slender capillaries which do not project externally; ventral ramus with compound setae.

The presence of four pairs of tentacular cirri, a reduced median tentacle and the absence of lateral tentacles in this genus differentiate it from the other known Hesionid genera.

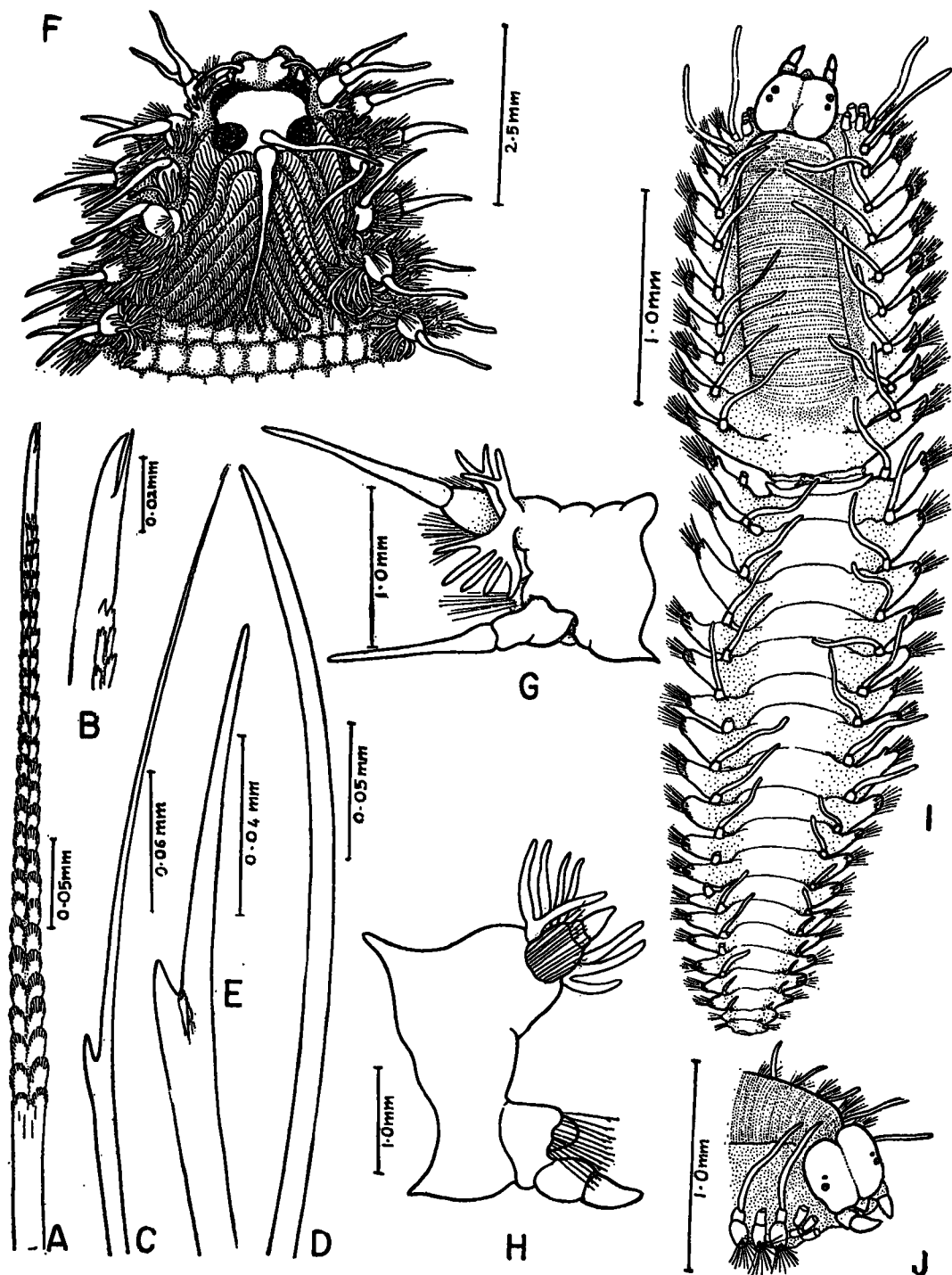


FIGURE 4. *Harmothoe ampullifera* (Grube), A & B. A, Ventral seta from the 6th foot; B, Tip of a ventral seta enlarged. *Eurythoe complanata* (Pallas), C—E. C, Ventral seta with one arm greatly elongated; D, Dorsal seta from the middle of the dorsal bundle of the 3rd foot. E, Seta from the ventral part of the 3rd foot. *Pherecardia striata* (Kinberg), F—H. F, Dorsal view of anterior end; G, Posterior view of 1st left foot; H, Anterior view of 2nd left foot. *Bonuania parva*, gen. et sp. nov., I—J. I, Dorsal view of worm; J, Right lateral view of anterior end.

Bonuania parva sp. nov.
(Fig. 4, I-J; Fig. 5, A-D)

This species is taken as the type for the genus.

Two specimens were collected from a milkfish pond in Bonuan, Dagapan City, Luzon. The smaller specimen is 4.25 mm. long, 1.5 mm. wide and has 29 setigers. The larger specimen is 8.25 mm. long, 1.8 mm. wide and has 48 setigerous segments of which the last three are very small.

Both specimens are similar with regard to colouration in formalin. The posterior two-thirds of the body and the feet possess ramifying yellowish glandular masses which are seen through the body wall.

The dorsal body wall of the anterior part of the body, up to the 8th setiger, is translucent and raised into a longitudinal column. The rest of the body is flattened (Fig. 4, I).

The prostomium (Fig. 4, I & J) is bilobed and bears two pairs of eyes of which the anterior pair are slightly larger. A single median tentacle is present. It is reduced to a small triangular lobe. There are two biarticulate palps. Lateral tentacles are absent. There are four pairs of tentacular cirri (i.e., 4 on either side) which, like the dorsal cirri, are deciduous. In the specimen figured (Fig. 4, I) they are represented by their bases, the tentacular cirri having fallen off.

The dorsal rami of the feet are reduced to a few slender capillary setae (usually 3) which run to the base of the dorsal cirrus but do not project externally (Fig. 5, A). The feet therefore appear uniramous. The ventral ramus bears one or two acicula and about twenty compound setae with somewhat hooked tips. The more dorsal setae (Fig. 5, B) have long serrated blades with curved tips. The most ventral setae have short blades and smaller serrations (Fig. 5, C). The setae in between have blades of intermediate size.

In the 5th and succeeding feet, the tip of the setigerous lobe bears a small anterior projection. The 5th foot has 3 acicula. The 15th foot also has 3 acicula and the ventral setae have shorter terminal pieces. In the 20th foot the setae are more prominently hooked. Setae decrease in number posteriorly.

The second specimen is similar. In both specimens the anus is terminal on the last segment.

Type specimens: Holotype. University of Ceylon, RTS. 15.
Paratype. British Museum (Natural History).

Family SYLLIDAE Grube, 1850

Genus PARAUTOLYTUS Ehlers, 1900

Parautolytus luzonensis sp. nov.
(Fig. 5, E-I; Fig. 6, A-C)

Two specimens were collected from a milkfish pond in Bonuan, Dagapan City, Luzon. The longer specimen is 50.0 mm. long, 2.0 mm. wide and has about 185-190 setigers. The second specimen is in two fragments. Its total length is 35.0 mm. and it is 2.0 mm. broad.

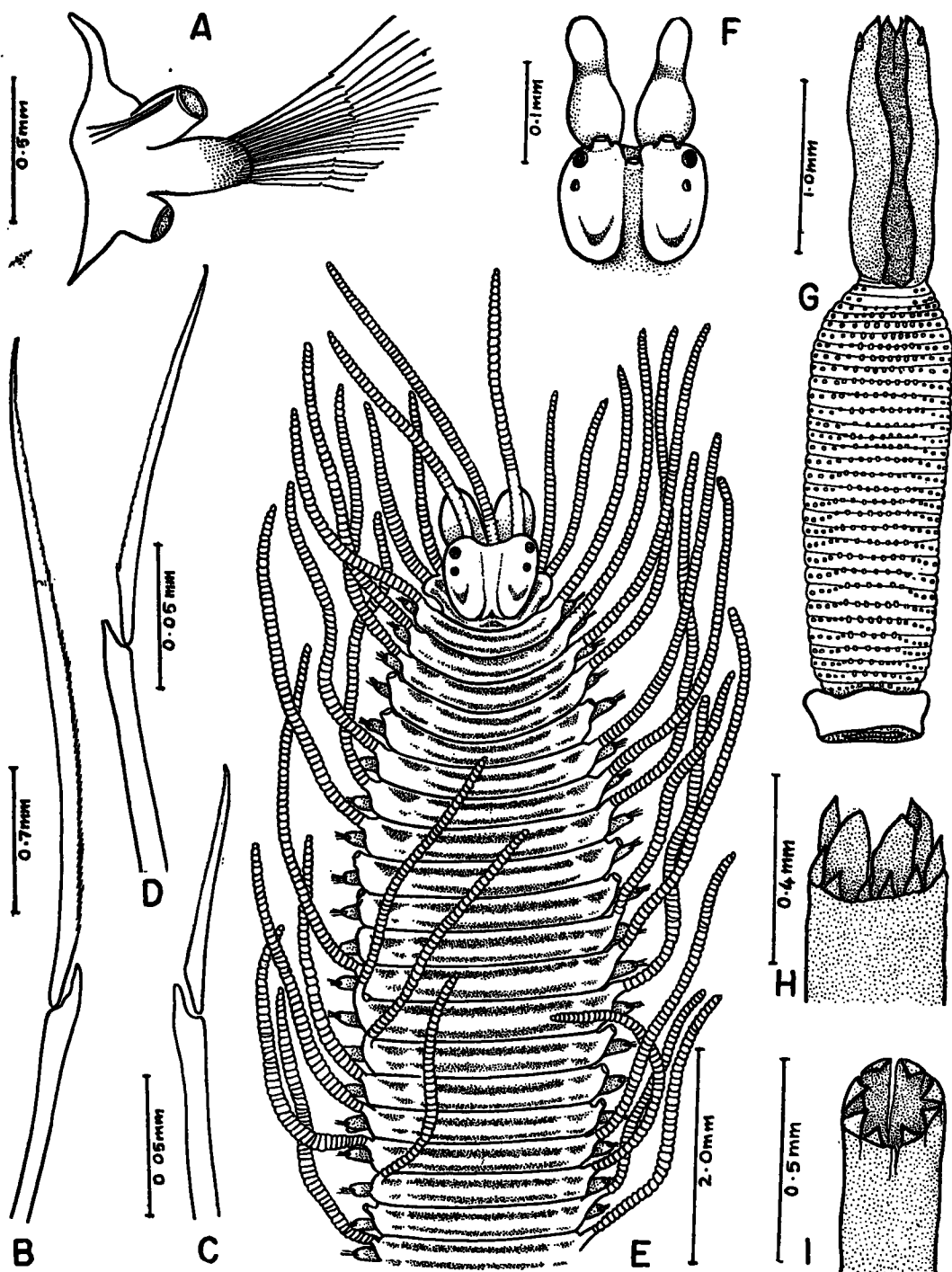


FIGURE 5. *Bonuania parva* gen. et sp. nov., A—D. A, Posterior view of the 1st right foot; B, Seta from the dorsal part of the 1st foot; C, Seta from the ventral part of the 1st foot; D, Seta from the middle part of the 1st foot. *Parautolytus luzonensis* sp. nov. E—I. E, Dorsal view of the anterior part of the body; F, Dorsal view of prostomium; G, Proboscis of 1st specimen; H, Anterior end of the pharynx of the 1st specimen; I, Anterior end of the pharynx of the 2nd specimen.

The body is flattened and ribbon-like. The posterior part of each prostomial lobe has a V-shaped brown pigment patch. The anterior 55 setigers or so have two main transverse bands (Fig. 5, E). The anterior band has a triangular brown patch on either side and the posterior band also has a small pigment patch on either side. The segment bearing the tentacular cirri has two postero-median pigment patches and two lateral pigment patches on each side.

The prostomium (Fig. 5, E) is bilobed. The palps are separate throughout. The three tentacles arise from the anterior margin of the prostomium. Two pairs of eyes are present of which the anterior pair are larger. There are two pairs of tentacular cirri. The tentacles, tentacular cirri and the dorsal cirri are articulated.

In the proboscis (Fig. 5, G), the pharynx is straight and black in colour. It is a little longer than half the length of the proventriculus. The anterior end of the pharynx in one specimen bears a row of soft papillae, an inner row of 4 large, triangular, scoop-like plates and an outer row of 6 small triangular plates all pointing forwards (Fig. 5, H). In the second specimen there are, in addition to the papillae, 8 medium-sized triangular plates which are arranged in a single row and which point forwards and inwards (Fig. 5, I). A significant feature of both specimens is that they lack a mid-dorsal tooth in the pharynx.

The feet (Fig. 6, A) are uniramous and similar throughout the body. Ventral cirri are present. The dorsal part of the setigerous lobe has 3–4 acicula which are yellowish-brown in the anterior segments but darker posteriorly. Setae are all compound and with bidentate terminal pieces (Fig. 6, B & C). These terminal pieces are shorter in the more posterior feet and, in each foot, they are shorter in the more ventral setae.

Except for the difference in the pharyngeal armature, both specimens are identical. Since ventral cirri are present and the pharynx lacks a middorsal tooth but possesses only a trepan of plate-like teeth which do not point backwards, these specimens come within the scope of *Parautolytus*. Only one species of *Parautolytus* has been described so far, namely, *P. fasciatus* Ehlers 1900. It is a very small species, about 11.0 mm. long (Gravier, 1908–1910, p. 42; Hartman 1964, p. 83). Unlike in *P. fasciatus*, the antennae and dorsal cirri are annulated, the ventral cirri nearly reach the end of the setigerous lobe and the pharynx is armed with 1 or 2 rows of large chitinous plates in *P. luzonensis*.

Type specimens: Holotype. University of Ceylon, RTS. 16
Paratype. British Museum (Natural History).

Genus *EUSYLLIS* Malmgren, 1867

Eusyllis edenticulata sp. nov.

(Fig. 6, D–G)

One specimen, nearly complete, was collected from a milkfish pond in Bonuan, Dagupan City, Luzon. It is 16.5 mm. long, 1.5 mm. broad and possesses 64 setigers. Its posterior tip is damaged and most of the tentacular cirri and tentacles had dropped off.

The body (Fig. 6, D) is somewhat rounded dorsally. The dorsal pigmentation is as follows: The segment bearing the tentacular cirri has 4 short transverse brownish streaks along its posterior border. The succeeding segments have three short, narrow,

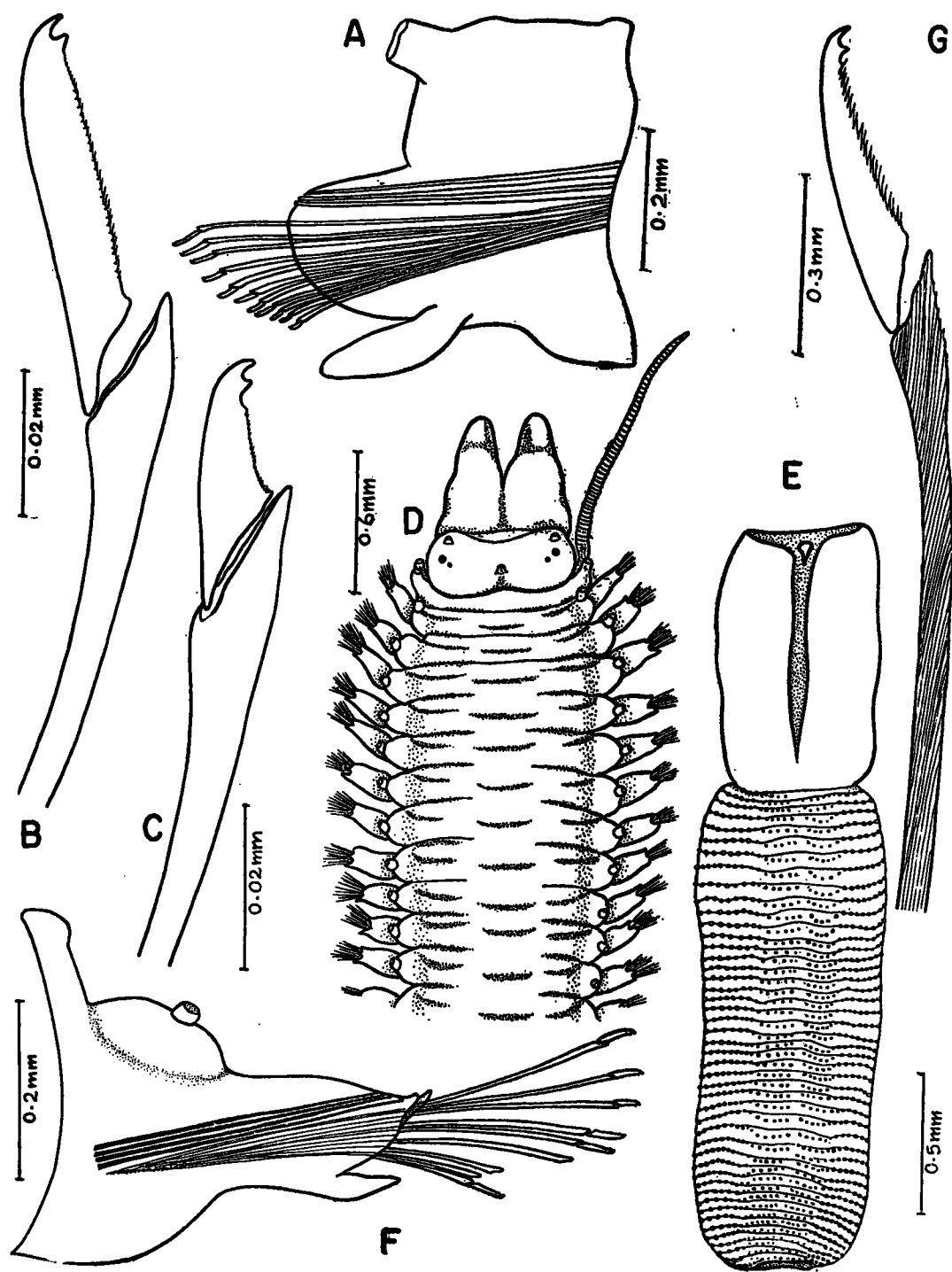


FIGURE 6. *Parautolytus luzonensis* sp. nov. A, Foot from the middle of the body; B, Seta from the ventral part of the 1st foot; C, Seta from the ventral part of the middle of the body. *Eusyllis edenticulata* sp. nov., D—G. D, Dorsal view of the anterior end; E, Proboscis; F, Posterior view of the 19th right foot; G, Seta from a posterior foot.

transverse brownish pigment streaks, one on each antero-lateral aspect and the other mid-dorsally. On the posterior end of each segment, more or less intersegmentally, there are two more similar pigment streaks, one on each side.

The prostomium (Fig. 6, D) is somewhat rectangular in outline. It has two pairs of eyes, of which the anterior pair is larger. The two eyes of each side are situated close together. The palps are fused at the base along about half their length and their distal extremities are somewhat conical. The bases of the lateral tentacles are situated anterior to the eyes while that of the median tentacle is situated slightly posterior to the eyes. Only one tentacular cirrus is present, the others having dropped off. It is transversely wrinkled.

In the proboscis (Fig. 6, E), the pharynx extends till the 8th setiger and the proventriculus from the 9th to the 19th setiger. The pharynx is black and bears a single sub-terminal conical tooth and a row of soft papillae. It is devoid of a trepan and its anterior margin is quite smooth.

The feet (Fig. 6, F) are uniramous. While the dorsal cirri arise at some distance from the foot, the ventral cirri are situated nearer the end of the setigerous lobe. Each setigerous lobe has two small conical lobes dorsally; one is antero-dorsal and the other is postero-dorsal. There is a bundle of acicula in the dorsal part of the setigerous lobe. There are 3 acicula in the first foot, 4 in the fourth and succeeding feet till the middle of the body, and 3 in the posterior feet. The setae are all compound (Fig. 6, G). Their distal joints are serrated along one edge and end in bidentate tips. Their shafts are obliquely striated and minutely serrated near the articular joints.

E. ceylonica Augener 1926 is somewhat similar to the present species. However, unlike in the present species, its dorsal cirri are alternately long and short, the longer ones inserted much more above the feet than the shorter ones. The cirrophores of the present species do not show this condition. The pigmentation of *E. ceylonica* is also different. It is reddish-yellow or yellow, with two transverse bands on each segment. Furthermore, the two dorsal lobes of the feet in the present species have not been reported for *E. ceylonica*.

Type specimen : Holotype. University of Ceylon, RTS. 17.

Family NEREIDAE Johnston, 1865

Sub-family DENDRONEREINAE Pillai, 1961

Genus DENDRONEREIS Peters, 1854

Dendronereis pinnaticirris Grube 1878

(Fig. 7, A—K; Fig. 8, A—I).

Dendronereis pinnaticirris, Grube 1878, p. 92, Taf. IV, Fig. 3-3c.

Numerous specimens were collected from brackish-water milkfish ponds in the following places in Luzon : Lucop (Alaminos, Pangasinan), Bonuan and Manat (vicinity of

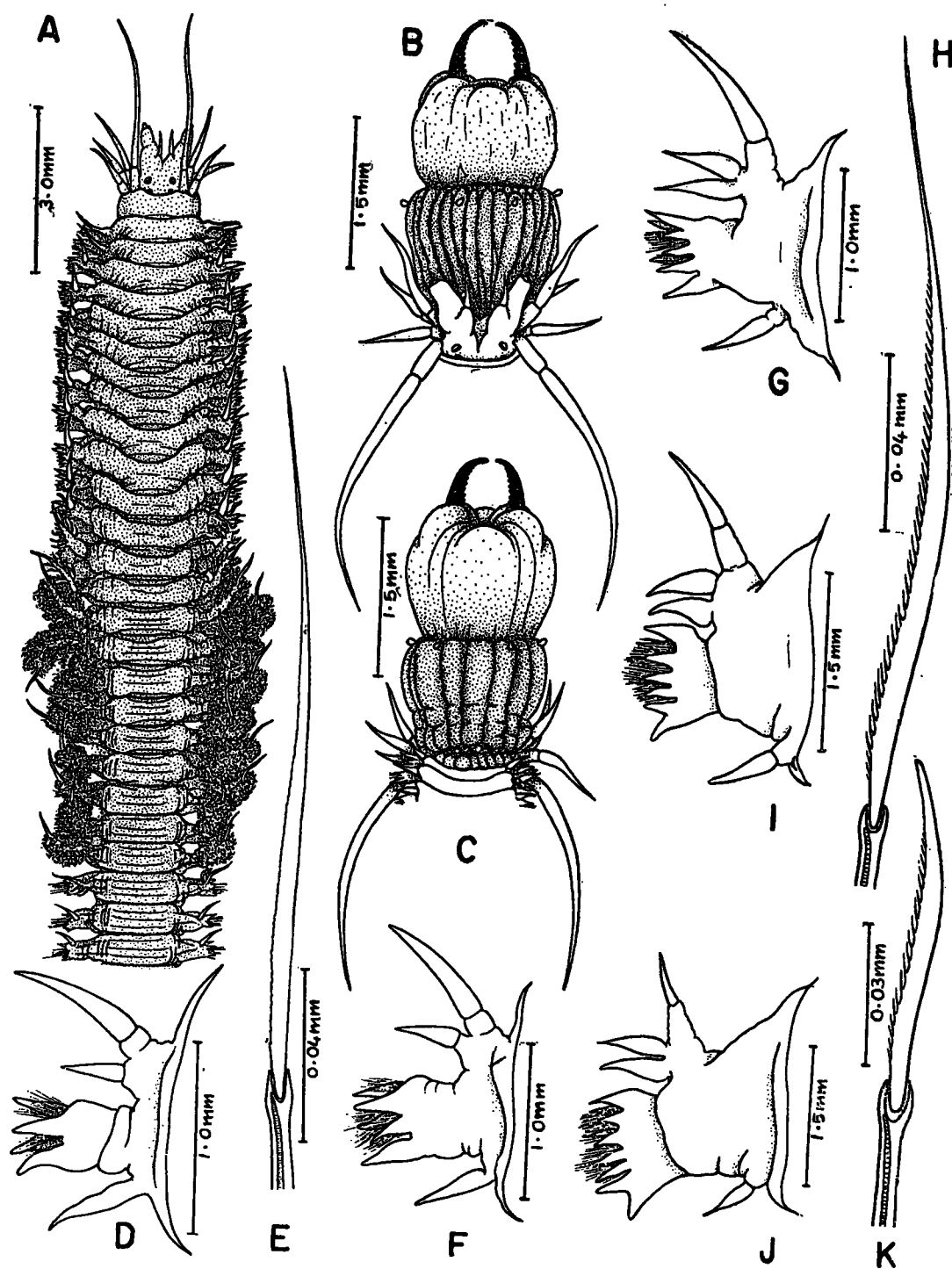


FIGURE 7. *Dendronereis pinnaticirris* Grube, A—K. A, Dorsal view of anterior end; B, Dorsal view of proboscis; C, Ventral view of proboscis; D, Posterior view of the 1st left foot; E, Seta from the first foot; F, Posterior view of the second left foot; G, Posterior view of the 3rd left foot; H, Seta with long serrations from the 10th foot; I, Posterior view of the 5th left foot; J, Posterior view of the 10th left foot; K, Seta with short terminal piece and long serrations from the 10th foot.

Dagupan City); Malabon and Dagat-dagatan (vicinity of Manila). In the Visayas (Philippines), they were observed in milkfish ponds in Iloilo, Cebu and Bacolod. In Mindanao, they were observed in milkfish ponds in Davao and Zamboanga.

Numerous specimens were also collected from brackish-water milkfish ponds in Surabaya, East Java, and the Island of Madura, in Indonesia.

The longest specimen in the collection is from Bonuan. It is 171.0 mm. long, 5.5 mm. wide and has 157 setigerous segments. However, another specimen from Manat (Dagupan City) has 138 setigers although it is 180.0 mm. long and 5.5 mm. wide. The width given is of the widest region of the body which is in the region of setigers 5—8. The smallest complete specimen from Manat is 55.0 mm. long, 2.5 mm. wide and has 79 setigerous segments. The smallest specimen from East Java is 52.0 mm. long and 2.5 mm. wide but has 114 setigers.

The following description of *D. pinnaticirris* is based on the study of 100 specimens selected at random.

The prostomium (Fig. 7, A & B) is deeply cloven anteriorly and the two halves are continuous with the palpophores. The pair of short tapering tentacles arise from ovoid tentaculophores at the junctions between the palps and the prostomial halves. Of the four pairs of tapering tentacular cirri the longest reaches about the 6th setigerous segment, when bent backwards.

The proboscis (Fig. 7, B & C) is armed with a pair of jaws, each usually bearing 8—11 teeth. The difference in tooth counts between the jaws of the two sides is usually 1 or 2. Frequently they are equal in number. The smallest number of teeth observed is in a specimen from Manat which has 5 on the left and 6 on the right. The largest number of teeth is also in a specimen from Manat which has 10 on the left and 13 on the right.

The maxillary ring of the proboscis is devoid of paragnaths and papillae (Fig. 7, B & C). The oral ring is armed with only soft, rounded papillae. There are usually 6 papillae in all, which are arranged as follows: One on each dorso-lateral aspect, one on each lateral aspect and one on each ventro-lateral aspect. Variations from this basic pattern (about 9%) involve the presence of an extra papilla or the lack of one on each dorso- or ventro-lateral aspects. The oral portion of the proboscis is also thrown into many smooth longitudinal ridges.

The first foot (Fig. 7, D) has a tapering dorsal cirrus and a short dorsal ligule arising from a common stem which is separated from the ventral ramus. The latter has two anterior ligules, a posterior ligule, a ventral ligule and a ventral cirrus. This is the condition in about 50% of the specimens. In the others there are two posterior ligules, instead of one, in addition to the ventral ligule. The setae are arranged S—wise around the two anterior lobes of the ventral ramus, with one part of the S around the dorsal lobe and the other around the ventral lobe, with an aciculum between them. The setae are all homomorph spinigers with minute serrations along one edge of the blade (Fig. 7, E).

In the second foot (Fig. 7, F), the form and arrangement of the cirri, the ligules and setae are similar to those of the first foot. The usual number of posterior lobules in the

ventral ramus is two (including the ventral ligule). This is the condition in 73% of the worms. About 18% have 3 lobules and the rest have 4 lobules.

The third foot (Fig. 7, G) has two conical tapering ligules in the dorsal ramus. The setae of the dorsal ramus consist of about 15 homogomph spinigers with minute serrations and an aciculum. The ventral ramus has 3 posterior lobules in addition to the ventral cirrus in about 55% of the worms. About 33% have 4, 6% have 5, 5% have 2, and 1% have 6. There are none with less than 2 lobules in the 3rd foot. The setae of the ventral ramus are similar to those of the first and second feet. In addition, there are two setae with long serrations along one side of the blade (Fig. 7, H).

In the fourth foot, none of the specimens have less than 3 posterior lobules in the ventral ramus. About 52% have 4. The setae are similar to those of the 3rd foot.

By the 5th foot (Fig. 7, I) the basal joint of the dorsal cirrus becomes longer while the cirrus itself becomes shorter. The setae of the dorsal and ventral rami are homogomph spinigers which are often nearly smooth. The more ventral ones have shorter terminal pieces. There are, in addition, about 10–12 homogomph spinigers with long serrations, in the ventral ramus.

None of the worms have less than 5 posterior lobules in the 6th foot. About 50% have 6, 25% have 7, 21% have 5 and 4% have 8. In the succeeding feet, up to the 13th, there are 5–8 or rarely 9–10 posterior lobules in the ventral ramus. In the 14th foot, they range from 1–8. From here they rapidly decrease in number and, generally, by the 17th setiger, they are reduced to one posterior lobule in addition to the ventral ligule, as in the first setiger. In about 1% of the specimens, there are 2 lobules up to the 18th–21st setiger, after which they are reduced to one.

In the 10th foot (Fig. 7, J), the dorsal cirrophore is longer than in the 5th setiger. Homogomph spinigers with long serrations are present in addition to the normal homogomph spinigers. Of the former, the more ventral ones have short terminal pieces with blunt tips (Fig. 7, K).

Gills commence on the 11th–13th setigers and cease on the 22nd to 28th setigers. In about 83% of the worms they commence on the 12th foot, in 16% on the 13th foot and in about 1% on the 11th foot. They neither commence before the 11th nor cease after the 28th foot. In about 5% they cease on the 22nd foot, in 17% on the 23rd, in 37% on the 24th, in 30% on the 25th, in 5% on the 26th, in 5% on the 27th and in 1% on the 28th.

The dorsal cirrophore of the 12th foot (Fig. 8, A) is further elongated and bears a simple lateral gill filament or two. The 13th foot (Fig. 8, B) has both lateral and medial filaments on the elongated cirrophore. Some of these filaments may be branched bipinnately. Setae are similar to those of the 10th–12th feet. There are, however, only about 7 homogomph spinigers with long serrations in the ventral ramus.

The dorsal cirrophore (gill) becomes further elongated and branched in the 14th foot (Fig. 8, C). Bipinnate branching is clearly seen here. The gill filaments show a double channel for the circulation of blood. With regard to the setae, an interesting change is that there are no homogomph setae with long serrations.

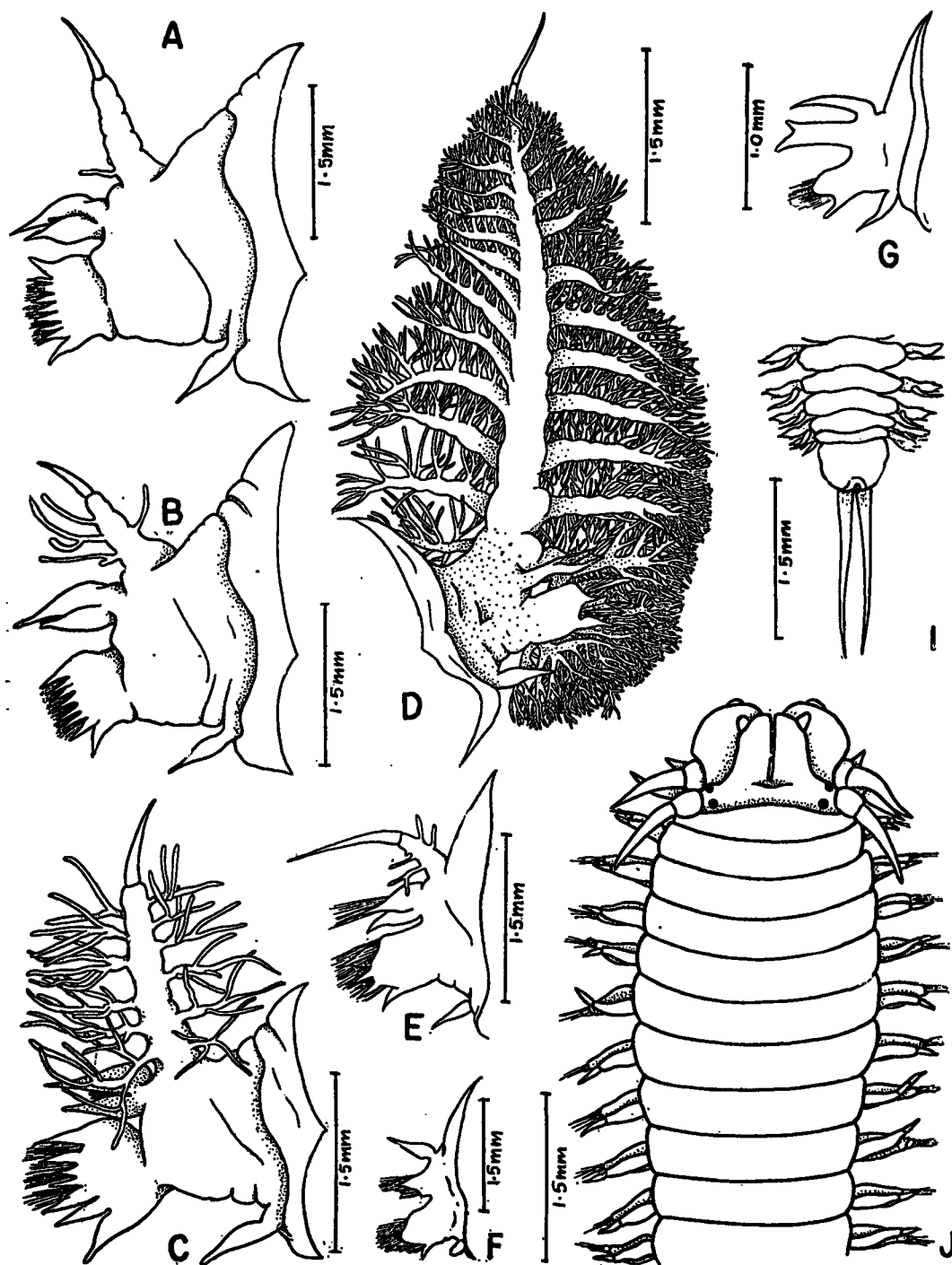


FIGURE 8. *Dendronereis pinnaticirris* Grube, A—I. A, Posterior view of the 12th left foot; B, Posterior view of the 13th left foot; C, Posterior view of the 14th left foot; D, Anterior view of the 19th left foot; E, Posterior view of the 24th left foot; F, Posterior view of a foot from the post-branchial region; G, Posterior view of the 120th left foot; H, Dorsal view of anal segment. J, *Namalycastis rigida* sp. nov., Dorsal view of anterior end.

In the succeeding branchiferous segments, as exemplified by the 19th foot (Fig. 8, D), the gill shows a tripinnately branched condition on its medial and distal portions and even quadripinnate branching on its ventro-lateral portions. The dorsal cirrus itself is reduced and can be recognized at the tip of the gill. The dorsal ramus has 2 ligules and homogomph spinigers. The ventral ramus has 2 anterior ligules, one posterior ligule, a ventral ligule and a ventral cirrus. Setae are all homogomph spinigers with long blades. Homogomph spinigers with long serrations are absent.

In the 24th setiger (Fig. 8, E) the gill is reduced, but the ligule arrangement and setae are similar to those of the 19th setiger. In the post-branchial segments (Fig. 8, F & G), the dorsal cirrus is normal and the ligules and setae of the two rami are similar to those of the 24th foot. The extreme posterior feet (Fig. 8, G) possess an elongated dorsal ramus with two ligules at its tip. The ventral ramus is short and bears an insignificant rounded anterior lobe, a similar posterior lobe and a ventral ligule.

The anal segment (Fig. 8, I) is short, somewhat rounded, and bears two long ventral anal cirri. The anal aperture is located posteriorly.

There appear to have been no records or descriptions of this interesting species since its original description by Grube in 1878 from the Philippines. *D. arborifera* Peters 1854 and *D. aestuarina* Southern 1921 are similar to the present species in many respects. *D. arborifera* has been reported from brackish-water (Fauvel 1953, Day 1934) and *D. aestuarina* was originally reported from brackish-water. Although *D. pinnaticirris* was originally described from sea-water, all the specimens in the present collection were obtained solely from brackish-water (milkfish ponds) in the Philippines and East Java. However, I have observed *D. pinnaticirris* being carried with the tides and with the flow of rain water into Manila Bay from fish ponds in the vicinity. It is a burrowing, brackish-water species living in mud. Being unable to tolerate pure fresh water during heavy rains, it leaves its burrow and is washed out to the sea with the flow of rain water or the tides.

With regard to anatomical similarities, all three species have branchiae which are modifications of the dorsal cirrophores, their probosces lack paragnaths and their setae are all homogomph, some of the latter possessing long serrations. However, there are important differences amongst themselves.

Southern (1921) was convinced that although Grube (1878) stated that *D. pinnaticirris* had neither paragnaths nor papillae and the same had been stated for *D. arborifera*, the papillae on the proboscis had been overlooked in both species. The present study shows that he was correct with regard to *D. pinnaticirris*. He was also correct with regard to *D. arborifera* since Fauvel (1953) states that soft conical papillae are present on both rings. *D. aestuarina* is similar to *D. pinnaticirris* in possessing papillae on the oral ring only.

The gills of the three species are different. In *D. arborifera* they are unipinnate (Fauvel, 1953) and in *D. aestuarina* they are bipinnate (Southern 1921, Fauvel 1953). According to Grube's description and figures (1878, Pl. IV, Fig. 3), the gills of *D. pinnaticirris* are bipinnate. However, according to the present work, the gills from the mid-branchial region show tripinnate or quadripinnate branching.

Branchiae occur from the 8th—10th to the 18th—22nd setigers in *D. arborifera* (Fauvel 1953). In *D. aestuarina* they occur from the 14th—15th feet and there are 8 pairs of branchiae (Fauvel 1953, Southern 1921). In *D. pinnaticirris* they commence on the 11th—13th feet and end on the 22nd—28th feet. An important difference is therefore with regard to the region of commencement of the gills.

With regard to the feet, in *D. arborifera*, "In the anterior feet, dorsal division with two triangular lobes, ventral division with 4—6 conical lobes and a few papillae. In the posterior feet, dorsal division bilobed, ventral division with a single large triangular lobe and a small ventral cirrus" (Fauvel 1953). In *D. aestuarina*, the 10th foot, as figured by Southern (1921), has 3 anterior lobes and one posterior lobe in the dorsal ramus. Its ventral ramus has 15—19 lobes of which 12 form a fringe behind the setae and the rest are anterior to the setae. In *D. pinnaticirris*, however, the dorsal rami of the feet do not possess more than two ligules, as in *D. arborifera*. In its anterior feet there are usually 5—8 or, rarely, 9—10 lobules which form a fringe behind the setae, thus differing from *D. aestuarina*. In the posterior feet of *D. aestuarina* the ventral ramus consists of two foliate lobes with a conical lobe between them, the ventral ligule and the ventral cirrus (Fauvel, 1953). In the extreme posterior feet of *D. pinnaticirris*, the dorsal ramus is elongated and longer than the ventral ramus. The ventral ramus has insignificant anterior and posterior lobes, a ventral ligule and a ventral cirrus, thus differing from the condition in the other two species.

D. pinnaticirris is a common pest in milkfish ponds in the Philippines and East Java where it burrows in the mud of the pond bottom. Together with *Marphysa gravelyi* Southern, which also burrows in the pond bottom, it is destroyed in large numbers by the use of poisonous chemicals before the commencement of fish-culture operations by certain fish farmers (Pillai, 1962).

Sub-family NAMALYCASTINAE Hartman, 1959

Genus NAMALYCASTIS Hartman, 1959

Hartman (1959) showed that *Lycastis* Savigny 1882 is a synonym of *Nereis* Linnaeus 1758 and proposed the name *Namalycastis* to replace it.

Namalycastis rigida sp. nov.

(Fig. 8, J; Fig. 9, A—I)

Nine specimens were obtained from a fisherman who was using them as bait for fishing *Tilapia mossambica* from a milkfish farm in Malabon, Luzon, Philippines.

The longest specimen (with its posterior tip missing) is 90.0 mm. long, 5.0 mm. wide and has 150 setigers of which about 10 constitute a formative region posteriorly. A complete specimen 49.0 mm. long and 3.5 mm. wide also has 150 setigers. The smallest complete specimen is 30.0 mm. long, 3.0 mm. wide and possesses 87 setigers.

The body is very stiff, much like that of a millipede. The cuticle is thick and coloured light reddish-brown throughout its dorsal aspect. It is somewhat lighter coloured ventrally. While the worms were being fixed, they did not show the wriggling movements

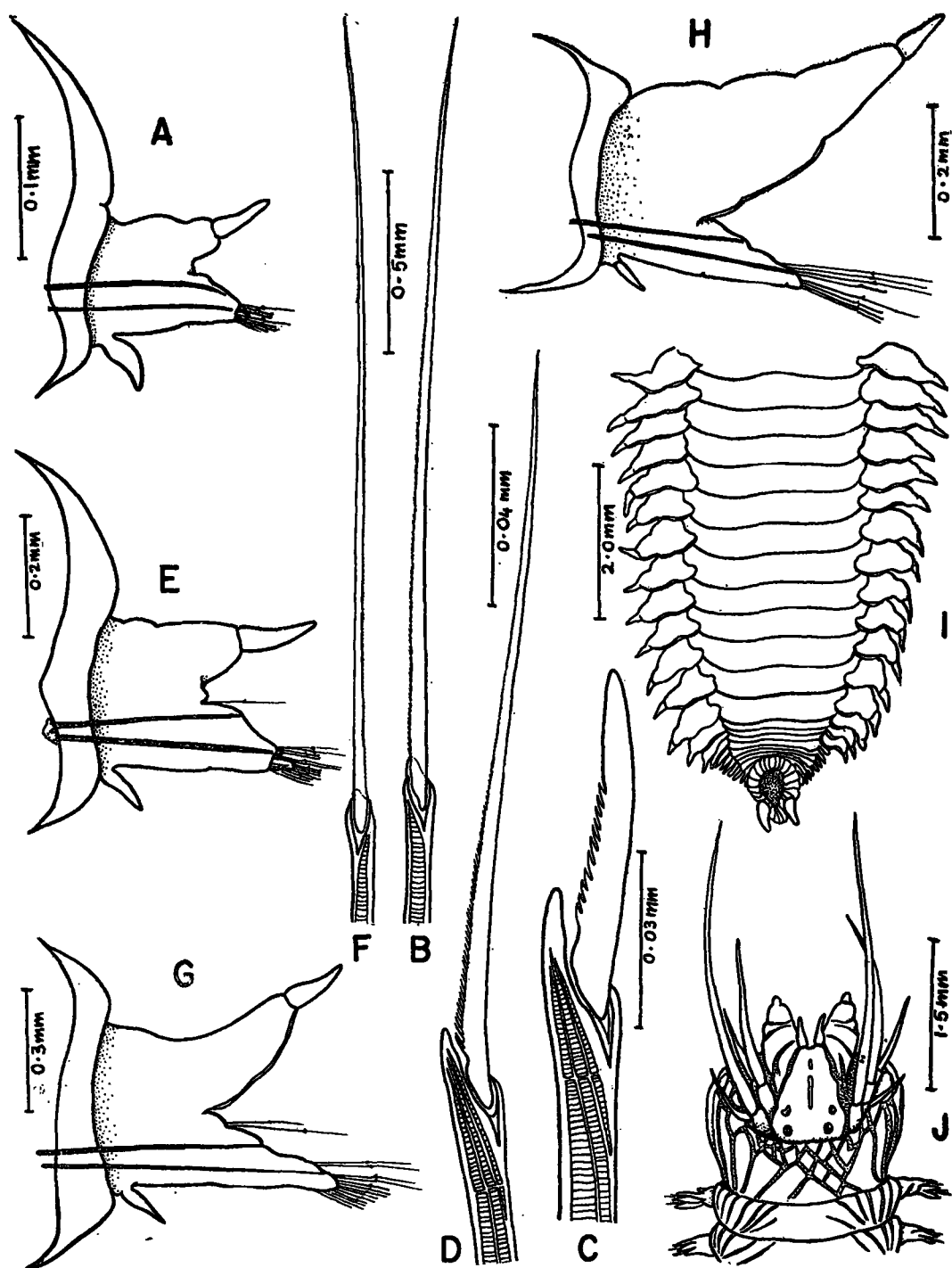


FIGURE 9. *Namalycastis rigida* 'sp. nov., A—I. A, Anterior view of the first left foot; B, Hemigomph spiniger from the first foot; C, Heterogomph falciger from the first foot; D, Heterogomph spiniger from the first foot; E, 5th left foot, anterior view; F, Dorsal homigomph spiniger from the 5th foot; G, Anterior view of the 25th left foot; H, Anterior view of the 75th left foot; I, Posterior end of the worm. *Neanthes negomboensis* de Silva, J, Dorsal view of anterior end.

normally displayed by nereid worms when subjected to irritant fluids. Instead, they remained more or less straight or only curved slowly into an arc or semi-circle and were fixed in that position.

The prostomium (Fig. 8, J) is cloven dorsally but its two halves are not divergent. The cleft ends posteriorly in a slight depression bordering a short transverse groove. Two pairs of eyes are present postero-laterally. Two short conical tentacles are present antero-laterally. Palps are massive. The tentacular cirri are short, conical and stiff. The longest tentacular cirrus reaches the third setigerous segment, when bent backwards. The proboscis is armed with a pair of jaws but lacks paragnaths and papillae.

The feet are sub-biramous and dorsal and ventral ligules are absent throughout the body. The first foot (Fig. 9, A) has short dorsal and ventral cirri. Its setigerous lobe has a small conical process at its tip and carries two acicula, one in the dorsal part of the lobe and the other more ventrally. Above the ventral aciculum there are usually 1 hemigomph spiniger (Fig. 9, B) and two heterogomph falcigers (Fig. 9, C). Below it there is one heterogomph spiniger (Fig. 9, D) followed by 7 heterogomph falcigers. The second to fourth feet are similar to the first.

In the 5th foot (Fig. 9, E) the dorsal cirrophore is somewhat enlarged and, unlike in the feet anterior to it, there is one homogomph spiniger (Fig. 9, F) above the dorsal aciculum. Above the ventral aciculum there are about 2 hemigomph spinigers and 2 heterogomph falcigers while below it there are 2 heterogomph spinigers and 10 heterogomph falcigers. In the 10th foot, the dorsal cirrophore is larger and the numbers and arrangement of the various setae are similar, except that there are about 9 heterogomph falcigers ventrally.

The dorsal cirrophore is further enlarged and foliaceous in the 25th foot (Fig. 9, G). There are 2 homogomph spinigers above the dorsal aciculum. The remaining setae are identical in number and arrangement to those of the 10th foot. The 50th foot is also similar, except for the more foliaceous dorsal cirrophore and the presence of only a single homogomph spiniger above the dorsal aciculum.

In the 75th foot (Fig. 9, H), the dorsal cirrophore is greatly enlarged and foliaceous. There are no setae above the dorsal aciculum. This is also the condition in the remaining feet. Above the ventral aciculum there are three hemigomph spinigers and one heterogomph falciger. Below it there is one heterogomph spiniger, followed by 3 heterogomph falcigers. The 12th foot from the posterior end has only one hemigomph spiniger above the ventral aciculum and 1 heterogomph spiniger and 4 heterogomph falcigers below it.

The anal segment (Fig. 9, I) bears a pair of short pyriform anal cirri on the posterior lip of the anal aperture. The latter is dorsal in position, its lip is pigmented brown and thrown into many smooth ridges separated by grooves.

Hartman (1959) described *N. abiuma* Muller in Grube 1871 and stated that the several species of *Lycastis* listed therein could be referred to a single species resembling it or to closely related and generically identical forms. Among these are *N. meraukensis* (Horst) 1918, *N. indica* Southern 1921. These two species are distinct from *N. abiuma* and the Philippine material although they are all very closely related.

In *N. abiuma*, the two eyes on each side of the prostomium are nearly coalescent. The two halves of the prostomium are incised and separated anteriorly. Notopodial setae

are absent, or an occasional slender compound spiniger is present above the aciculum. Neuropodial setae consist of heterogomph spinigers and heterogomph falcigers in equal numbers.

The specimens from the Philippines are different from *N. abiuma* in the following respects. The prostomial halves are not divergent anteriorly. The two eyes on each side are considerably separated from one another; they are arranged nearly one behind the other. Dorsal compound setae (1 or 2) are present in the anterior feet and absent in the posterior feet. The number of heterogomph falcigers in the ventral ramus is about thrice that of the heterogomph spinigers. A characteristic feature of the heterogomph spinigers and heterogomph falcigers of the Philippine material is that the longitudinal medullary columns within their shafts appear broken a short distance from the articular joints (Fig. C & D). Three such columns are present near the articular joints.

The Philippine material is also different from *N. meraukensis* (Horst). According to Fauvel (1953), the dorsal setae are numerous (8—10 as given in his description of *N. meraukensis*). In the Philippine material, however, they do not exceed 1 or 2. The medullary columns of the shafts, the spinigers and falcates in *N. meraukensis* also need to be described.

N. indica (Southern) is different from both *N. meraukensis* and the present material from the Philippines. The numerous specimens of *N. indica* collected from Ceylon by Dr. P. H. D. H. de Silva of the Colombo Museum have been examined by me and even on superficial examination they appeared different from the Philippine material. A characteristic feature of *N. indica* is that the dorsal cirrophores of the posterior part of the body are slender and elongated, resembling a syllid. The posterior part of *N. rigida* resembles that of a phyllodocid. Further, unlike in *N. rigida* and *L. meraukensis*, the eyes are situated almost in a row in *N. indica*. Moreover, unlike in *L. meraukensis*, and like in *N. rigida*, dorsal setae are few, rarely exceeding 1—2.

N. indica is a more slender species than *N. rigida* and its body is comparatively soft and very flexible. The body of *N. rigida* is very firm. According to Fauvel (1953), *L. indica* is 12—150 mm. long and 2—5 mm. wide. In contrast, *N. meraukensis* is an extremely broad species. According to Fauvel (1932 p. 82 and 1953 p. 167), it measures 150—200 mm. in length and 20—22 mm. in width.

Type specimens : Holotype and 3 Paratypes. University of Ceylon, RTS. 18.
Paratypes. British Museum (Natural History)).

Sub-family NEREINAE Correa, 1948

Genus NEANTHES Kinberg, 1866

Neanthes negomboensis de Silva, 1965

(Fig. 9, J ; Fig. 10, A—L).

115 specimens were dug up during low-tide from the exposed muddy bottom of a milk-fish pond in Surabaya, East Java. The longest complete specimen is a female 54.0 mm.

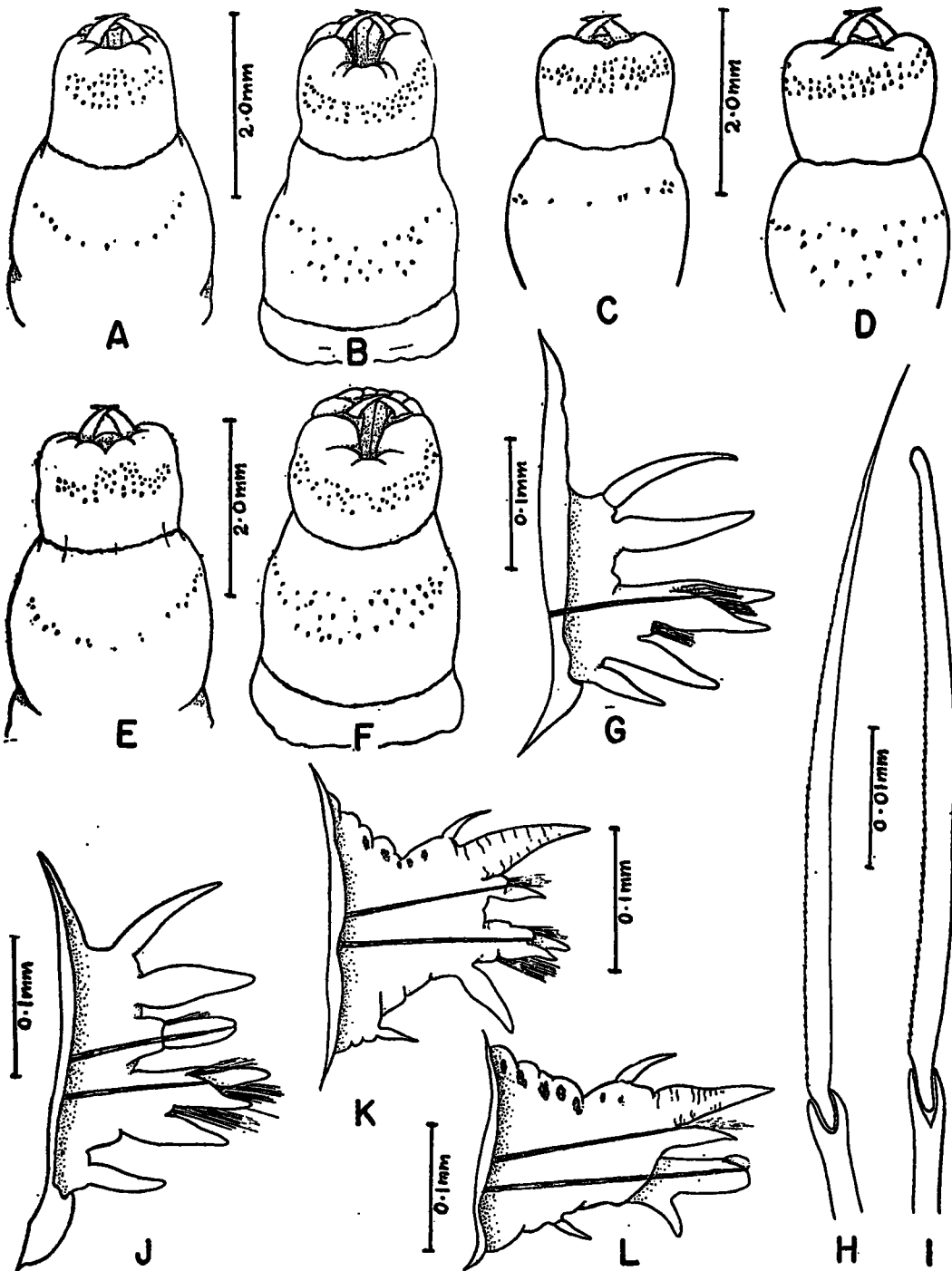


FIGURE 10. *Neanthes negomboensis* de Silva, A—I. A, C, E, Dorsal view of probosces of three worms; B, D, F, Ventral view of the same three probosces, respectively. G, Anterior view of the first left foot; H, Homogomph spiniger from the ventral ramus of the 1st foot; I, Homogomph falciger from the first foot; J, Anterior view of the 3rd left foot; K, Anterior view of the 20th left foot; L, Anterior view of the 50th left foot.

long, 4.0 mm wide and possessing 109 setigers. The smallest is 18.0 mm long, 2.0 mm wide and has 64 setigers.

The prostomium (Fig. 9, J) is not cloven anteriorly. It is triangular, longer than broad, and has a shallow longitudinal groove anteriorly which may be in two parts. There are two pairs of eyes and two short conical tentacles. The latter do not extend beyond the palps. The palps are stout and possess 2 or 3 transverse grooves, besides those that divide each palp into its component segments. The dorsal and lateral aspects of the peristomium and the dorso-lateral aspects of the anterior setigerous segments are also divided into small, polygonal areas by similar grooves. The longest tentacular cirrus reaches the 6th setigerous segment, when bent backwards.

The proboscis bears only hard paragnaths on both rings in addition to the pair of transparent yellowish-brown jaws in the maxillary ring. The arrangement of paragnaths is highly variable (Fig. 10, A - F). In the maxillary ring, the paragnaths of groups I and II form a broad continuous band which is broadest in the region of group I. The paragnaths of groups III and IV are also arranged in a similar band. Groups V and VI form a narrow, continuous band which may be in a single row (Fig. 10, A) or in more than one row (Fig. 10, C & E). Groups VII and VIII are again arranged in a broad continuous band which is usually broadest in the region of VII and narrowest towards the outer region of group VIII.

The first foot (Fig. 10, G) has a single dorsal ligule which is subequal to the dorsal cirrus. In the ventral ramus there is a triangular anterior ligule, a similar posterior ligule and a ventral ligule. The ventral cirrus is about half the length of the dorsal cirrus. The dorsal ramus bears no setae. The ventral ramus has an aciculum and homogomph spinigers (Fig. 10, H). There is also one homogomph falciger with its distal joint ending in a rounded tip (Fig. 10, I). The second foot is similar in all respects except that there are about 4 ventral homogomph falcigers.

In the third foot (Fig. 10, J), the dorsal ramus has a dorsal ligule and a cylindrical setigerous lobe. An aciculum runs to the tip of the latter and there are 3 - 4 homogomph spinigers. The lobes of the ventral ramus are similar to those of the first two feet and there are homogomph falcigers in addition to the homogomph spinigers. The 10th foot is similar to the 3rd and there are about 6 ventral homogomph falcigers.

The dorsal ligule of the 20th foot (Fig. 10, K) is flattened, triangular and foliaceous. The dorsal setigerous lobe has a small triangular lobe and the usual aciculum and homogomph spinigers. The ventral ramus has homogomph spinigers and about 10 ventral homogomph falcigers. The ventral ligule is separated from the setigerous lobe and the two ligules in the setigerous lobe are reduced. The dorsal and ventral cirri are small. The 30th foot is similar, except that the body of the foot is somewhat elongated and the anterior and posterior lobes of the ventral ramus are further reduced. The 40th setiger is similar in most respects. There are about 4 homogomph spinigers in the dorsal ramus and 3 or 4 homogomph spinigers and 1 or 2 homogomph falcigers in the ventral ramus.

In the 50th foot (Fig. 10, L), setae are often lacking from the ventral ramus which is cylindrical and elongated. It has 2 small rounded lobes at its tip and a small ventral ligule near its origin. An aciculum is also present. In the dorsal ramus, the dorsal ligule is

triangular and foliaceous while the more ventral ligule is also triangular but smaller. An aciculum and homogomph spinigers are also present.

The anal segment bears two long cirri below the anal aperture.

In sexually mature worms, the middle and posterior feet have foliaceous dorsal ligules and paddle-shaped ventral rami with rounded flap-like lobes (Fig. 10, L). The posterior part of the worm, from the 15th setiger onwards contains the ripe reproductive elements. They are also often found in the wall of the everted proboscis.

Brownish or violet pigment bodies are present in the feet, usually one in each foot, from the 22nd – 50th feet backwards. They do not occur in any fixed position and they are also occasionally found along the mid-dorsal regions of the body.

The proboscis of *Neanthes cricognatha* (Ehlers) 1905 shows some resemblance to that of the present species. However, unlike in the present species, Group I is isolated from group II and bears only 2 or 3 paragnaths (Fauvel, 1953). Further, groups II – III – IV form a continuous band and the ventral falcigers, as figured by Fauvel (1953, fig 91, C) are also different.

Neanthes manatensis sp. nov.

(Fig. 11, A–J)

Three specimens were collected; one from the brackish-water oyster farm at Manat, Dagupan City, Luzon, and the other two from a brackish-water milkfish farm, also from Dagupan City. Only one of them is complete. It is 23.0 mm. long, 3.0 mm. wide and possesses 65 setigerous segments and ripe eggs floating in the coelom. The second specimen, with its posterior tip missing, is 23.0 mm. long, 3.0 mm. wide and possesses 59 setigers and ripe eggs floating in the coelom.

The prostomium (Egg. 11, A) is elongated, somewhat rectangular in outline and its anterior margin is entire. Its anterior end, which is slightly narrower than the posterior end, bears a pair of cylindrical tentacles which extend a little beyond the tips of the palps. The posterior end has two pairs of eyes. A shallow median longitudinal groove is present on the anterior part of the prostomium. The palps are massive, ovoid, and their distal joints are very small compared to their basal joints. The longest tentacular cirrus, when bent backwards, reaches the 4th setiger. The peristomium and anterior setigers are marked by grooves dorso-laterally (Fig. 11, A).

The proboscis (Fig. 11, B & C) has hard paragnaths on both maxillary and buccal rings. None of the specimens had its proboscis everted and hence the arrangement of the paragnaths had to be determined by dissection. In the maxillary ring, group I has a single large paragnath; II has a cluster of 10 – 15; III has about 15 arranged in approximately 3 rows and IV has a cluster of 7 – 12 paragnaths. In the oral ring, group V has 2 large paragnaths side by side; VI has 3 or 4 small paragnaths and VII – VIII consist of a continuous band of about 3 to 4 rows of paragnaths.

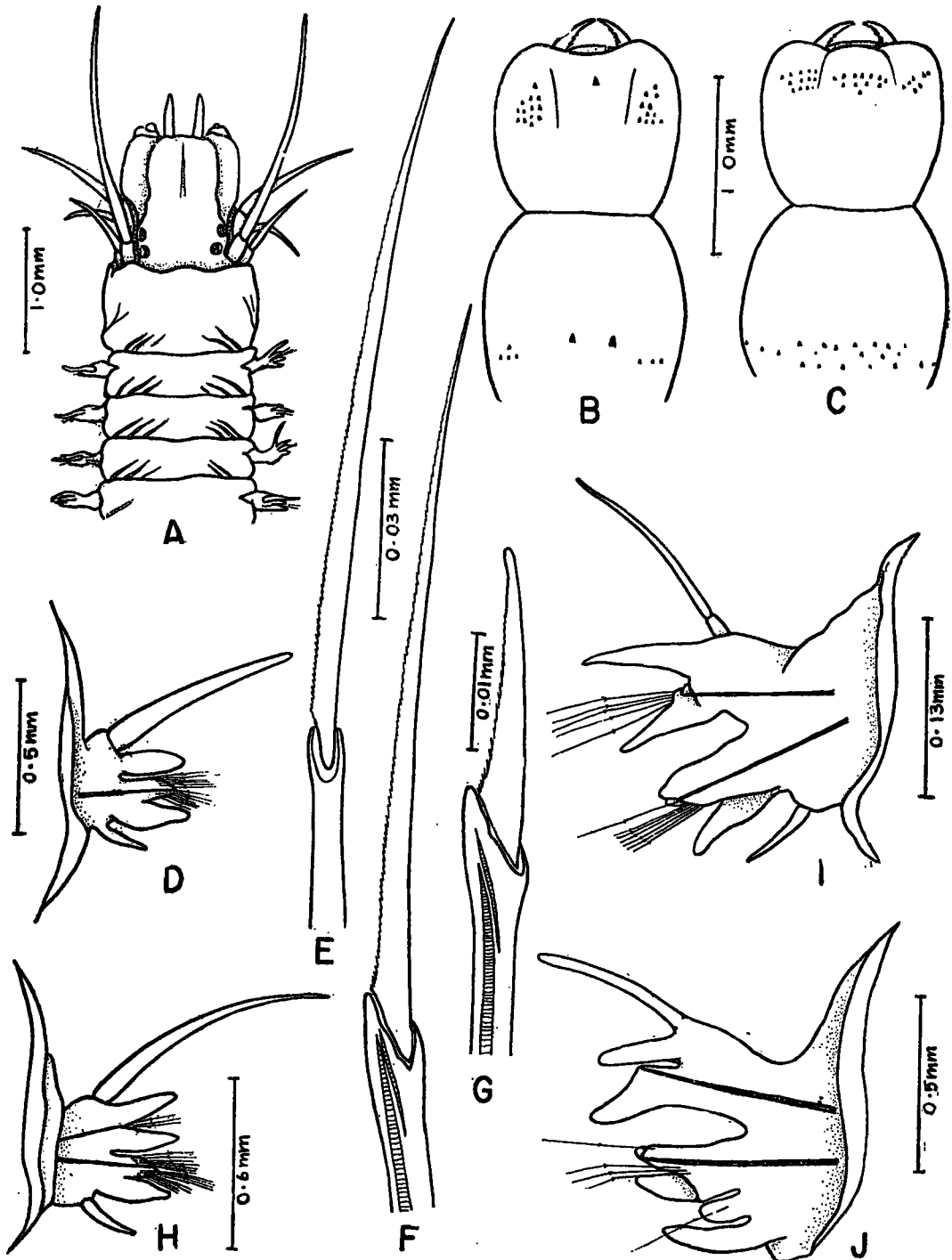


FIGURE 11. *Neanthes manatensis*, sp. nov., A—J. A, Dorsal view of the anterior end; B, Dorsal view of proboscis; C, Ventral view of proboscis; D, Anterior view of the 1st left foot; E, Homogomph spiniger from the 1st foot; F, Heterogomph spiniger from the 1st foot; G, Heterogomph falciger from the 1st foot; H, Anterior view of the 3rd left foot; I, Posterior view of the 20th left foot; J, Posterior view of the left last foot (ventral cirrus not shown).

The first foot (Fig. 11, D) has a long dorsal cirrus and a short ventral cirrus. The dorsal ramus is devoid of an aciculum and setae. The single dorsal ligule is somewhat club-shaped. The ventral ramus has a single median ligule and a longer ventral ligule. There are about 7 homogomph spinigers (Fig. 11, E) above the black aciculum of the ventral ramus. Below it, there are about 5 heterogomph spinigers (Fig. 11, F) and below these, in turn, are about 7 heterogomph falcigers (Fig. 11, G). The more dorsal falcigers have longer terminal pieces than the ventral ones. The second foot is similar to the first.

The 3rd foot (Fig. 11, H) has a much longer dorsal cirrus but its ventral cirrus is short. The dorsal ramus has two ligules of equal size and with somewhat rounded tips. There are 3 homogomph spinigers between them. In the ventral ramus, there is a single setigerous lobe and a ventral ligule similar to that of the first two feet. The setal arrangement in the ventral ramus is as follows: In the most dorsal part there is a group of about 4 homogomph spinigers. Below them is a group of 4 heterogomph falcigers. Below the aciculum there are about 5 heterogomph spinigers and below them, in turn, about 7 heterogomph falcigers. The 5th foot is similar, except that there are 4 homogomph spinigers in the dorsal ramus and the most ventral group in the ventral ramus consists of 12 heterogomph falcigers.

On setigers 9–15 the dorsal cirri are much longer than in the other segments. In the 10th foot, the dorsal ramus has about 11 homogomph spinigers. In the ventral ramus, the arrangement of the setae, dorso-ventrally, is as follows: 5 homogomph spinigers, 11 heterogomph spinigers and about 10 heterogomph falcigers. The most dorsal ligule of the dorsal ramus is now larger and more flattened.

In the 20th foot (Fig. 11, I), the dorsal cirrus is now more slender and shorter than in the segments preceding it. The two triangular lobes of the dorsal ramus are also shorter. There are about 5 homogomph spinigers in the dorsal ramus. In the ventral ramus there are now two short triangular lobes, one situated anteriorly and the other posteriorly. The arrangement of the setae in the ventral ramus, dorso-ventrally, is as follows: 3 homogomph spinigers, 1 heterogomph spiniger, and 6 heterogomph falcigers. The 25th foot is similar, but the ventral ramus is smaller. There are about 10 homogomph spinigers in the dorsal ramus. In the ventral ramus there are only 2 homogomph spinigers and 3 heterogomph falcigers. Heterogomph spinigers are lacking. The 30th foot is similar to the 25th.

In the 45th foot there are about 9 homogomph spinigers in the dorsal ramus. The ventral ramus has only 1 heterogomph spiniger and 2 heterogomph falcigers. The succeeding feet are similar.

The extreme posterior feet are, however, different. The last foot (Fig. 11, J) has only an aciculum in the dorsal ramus. The ventral ramus is subdivided into two lobes, the more dorsal one carrying the aciculum. Above the aciculum, there is a single homogomph spiniger and below it there are 3 heterogomph spinigers with short terminal pieces. The ventral subdivision of the ventral ramus and the ventral ligule arise from a common stem. It has a single heterogomph falciger. The ventral cirrus (not shown in the figure) arises separately as in the preceding setigers. The anal segment bears two anal cirri.

In *Neanthes mossambica* Day (1957) the feet and arrangement of paragnaths are somewhat similar to those of the present species, but the former has a cluster of 6 teeth in group I

and its posterior feet are different. In *N. glandicincta* (Southern) 1921, the dorsal ramus has 3 ligules in addition to the dorsal cirrus and groups VII – VIII consist of a single row of minute denticles, occasionally missing. In *N. chilkaensis* (Southern) 1921, group I has 6 – 10 paragnaths and the anterior feet have 3 ligules in the dorsal ramus. In *N. reducta* (Southern) 1921, the palps are long and pointed, groups V and VI and VII – VIII are different. In *N. capensis* Willey 1904, *N. megitti* Monro 1931 and *N. articulata* Knox 1960 there are three ligules in the dorsal ramus, unlike in the present species.

Type specimens : Holotype. University of Ceylon, RTS. 19.

Paratypes. British Museum (Natural History).

***Neanthes bongcoi* sp. nov.**

(Fig. 12, A – J).

Two specimens were collected from a milkfish farm in Bonuan, Dagupan City, Luzon. The longer specimen is 18.0 mm. long, 3.0 mm. wide and has 40 setigerous segments. It has ripe eggs floating in the coelom.

The medial aspects of the palps, the dorso-lateral aspects of the prostomium and the median and lateral aspects of the peristomium are pigmented brown. In the anterior setigers, there is a narrow transverse brown band across their dorsal aspects. It is continued as a mid-dorsal longitudinal band till the end of each segment.

The prostomium (Fig. 12, A) is triangular, longer than broad and is not cloven anteriorly. It lacks a mid-dorsal longitudinal groove. Two pairs of eyes are present, posterolaterally. The palps are massive and ovoid. The two slender tapering tentacles reach the tips of the palps. The longest tentacular cirrus, when bent backwards, reaches the 6th setiger.

The proboscis (Fig. 12, B & C) has only hard paragnaths in both rings. In the maxillary ring, group I has a single large cone; II has a cluster of 6 – 8 small paragnaths; III has a cluster of about 5 and IV has a cluster of 4 or 5. In the oral ring, group V lacks paragnaths; VI has a cluster of 3 or 4 and VII – VIII consist of 2 rows of large paragnaths, 6 in one row alternating with 6 in the other.

The first foot (Fig. 12, D) has a slender dorsal cirrus which is longer than the other lobes of the foot. The dorsal ramus has a single stout conical ligule and is devoid of an aciculum and setae. The ventral ramus has a single setigerous lobe ending in a stout conical lobe and a stout ventral ligule. Above the ventral aciculum there are homogomph spinigers and below it there are heterogomph falcigers. The second foot is similar to the first.

In the third foot (Fig. 12, E), the dorsal and ventral cirri are comparatively longer than in the first two feet. The dorsal ramus has a stout dorsal ligule and, below it, there are two well-developed conical lobes which are only slightly shorter than the dorsal ligule. An aciculum runs to a point between these two lobes. Dorsal setae, which arise postero-dorsal to the more dorsal lobe, are all homogomph spinigers (Fig. 12, F). The ventral ramus has a triangular anterior lobe which points ventrally and a similar but longer lobe which

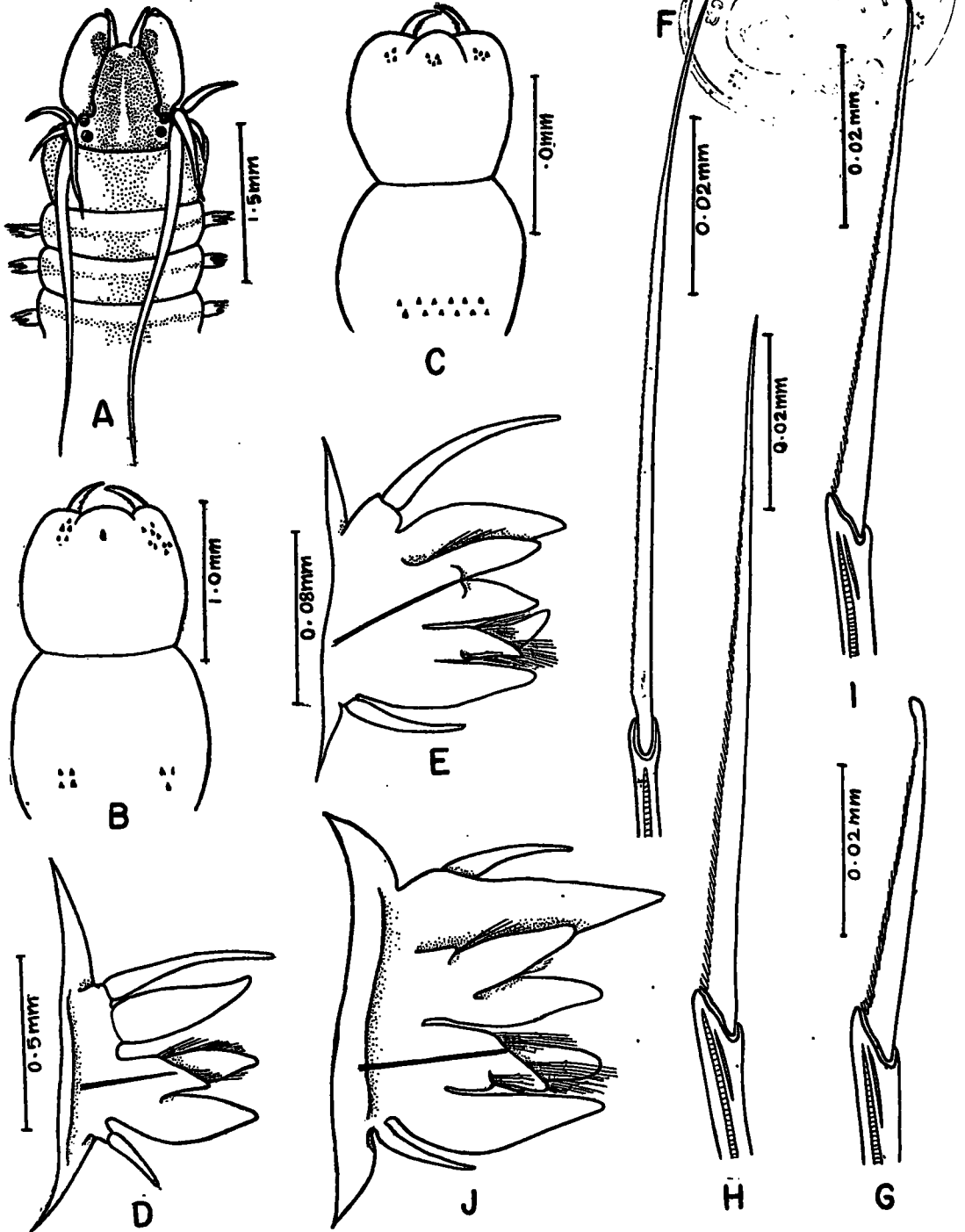


FIGURE 12. *Neanthes bongcoi* sp. nov., A—J. A, Dorsal view of the anterior end; B, Dorsal view of the proboscis; C, Ventral view of the proboscis; D, Anterior view of the 1st left foot; E, Anterior view of the 3rd left foot; F, Homogomph spiniger from the dorsal ramus of the 3rd foot; G, Heterogomph falciger from the 3rd foot; H, I, Heterogomph spinigers from the 3rd foot; J, Anterior view of the 5th left foot.

points upwards. A stout ventral ligule is present. The ventral setae are arranged dorso-ventrally as follows: A group of homogomph spinigers, a group of heterogomph falcigers (Fig. 12, G), the aciculum, a number of heterogomph spinigers and, most ventrally, another group of heterogomph falcigers. There is a transition (Fig. 12, H & I) from the heterogomph spinigers to the heterogomph falcigers of the ventral part. The falcigers terminate in a small rounded swelling.

The fifth foot (Fig. 12, J) has a shorter dorsal cirrus, a large conical dorsal ligule which is the largest outgrowth in the foot, and two other smaller conical lobes. The setae are similar to those of the 3rd foot, except for their larger number. The succeeding feet are similar but by the 20th foot the number of setae begins to decrease and the lobes of the ventral ramus become shorter.

In the 35th foot, the dorsal ligule is the largest outgrowth. Of the two other lobes in the dorsal ramus the more dorsal one is now considerably smaller than the other. The lobes of the ventral ramus are also smaller but the setae show no difference in kind and arrangement from those of the anterior feet.

Neanthes talehsapensis (Fauvel) 1932, *Neanthes chilkaensis* (Southern) 1921 and *Neanthes indica* (Kinberg) 1865 appear to have the closest resemblance to the present species. However, they can be distinguished from it as follows: In *N. talehsapensis* group I has 2 paragnaths one behind the other and groups VII–VIII consist of 3–4 rows of large conical denticles. In *N. chilkaensis*, group I has 6–10 paragnaths and groups II, III and IV have many more paragnaths than in the present species. In *N. indica* group VII–VIII consist of 1 or 2 rows of large teeth and a row of numerous minute denticles. Its ventral homogomph falcigers have sickle-shaped terminal pieces.

Type specimens: Holotype. University of Ceylon, RTS. 20.
Paratype. British Museum (Natural History).

Genus LEONNATES Kinberg, 1866

Leonnates decipiens Fauvel 1929, var. *manilensis* nov.
(Fig. 13, A–I; Fig. 14, A–D)

Three specimens were collected from the Government Oyster Farm at Binakayan, Cavite, Manila Bay, Philippines. The preserved specimens do not show any pigmentation. The longest specimen is 40.0 mm. long, 3.0 mm. long and possesses 98 setigerous segments. It has ripe eggs floating in the coelom. The other two specimens are very small. One is 15.0 mm. long, 1.5 mm. wide and has 58 setigerous segments. The other is 12.0 mm. long, 1.0 mm. wide and has 62 setigers.

The anterior part of the body is rounded in cross-section, but flattened from about the 15th–20th setiger backwards. Characteristic glandular masses are present on the dorso-lateral aspects and at the bases of the dorsal cirri. They are especially prominent in the flattened part of the body and are found till the very end of the worm. In the two small specimens, they commence on the 8th and 10th setigers.

The prostomium (Fig. 13, A) is not cloven but has a shallow median longitudinal groove dorsally. It bears two slender tentacles which extend somewhat beyond the

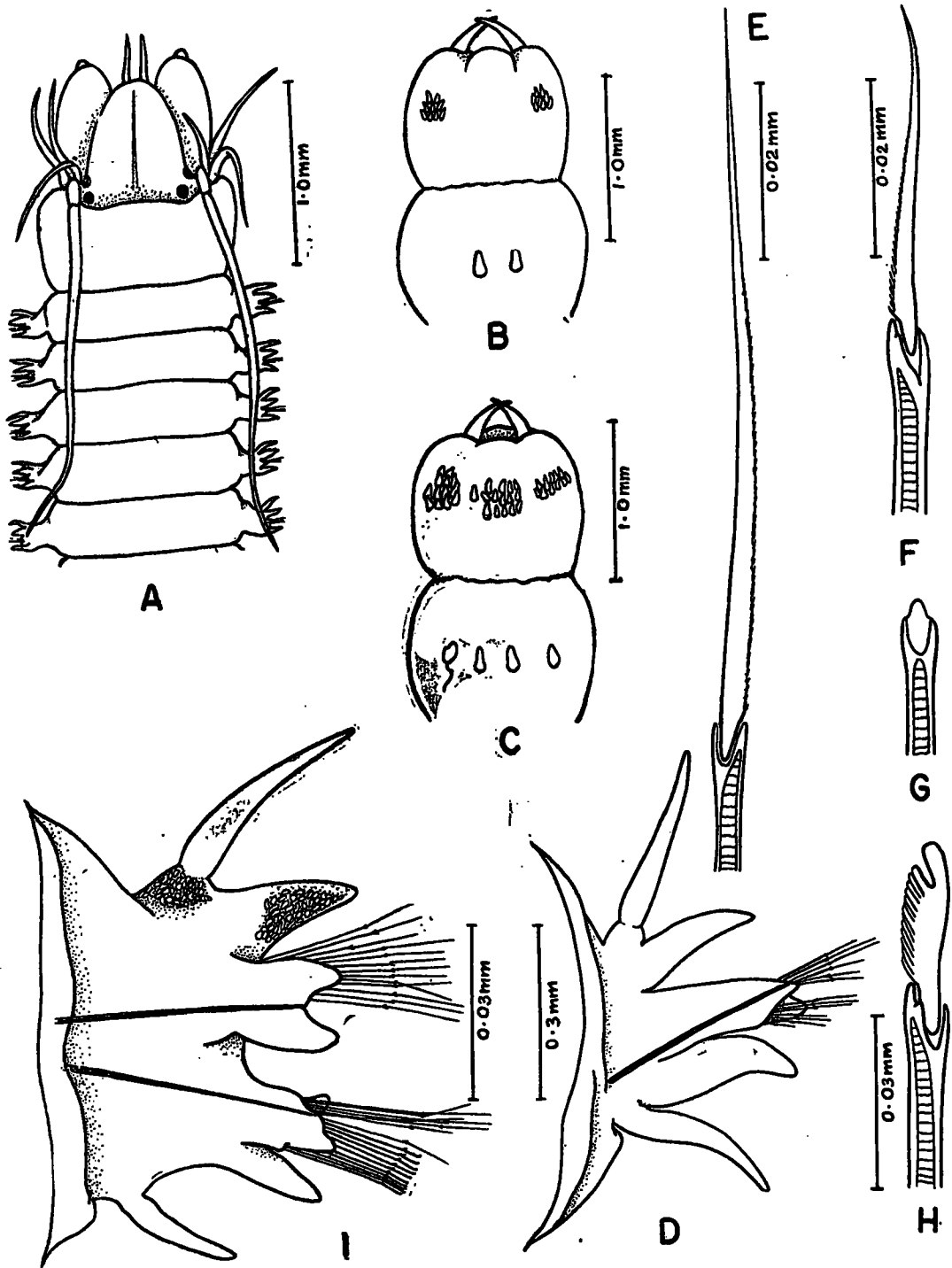


FIGURE 13. *Leonnates decipiens* Fauvel, var. *manilensis* nov., A—I. A, Dorsal view of anterior end; B, Dorsal view of proboscis; C, Ventral view of the proboscis; D, Anterior view of the first foot; E, Homogomph spiniger from the first foot; F, Nearly heterogomph spiniger from the 15th foot; G, articular socket of seta shown at F; H, Falciger with nearly heterogomph articular joint; I, Anterior view of the 15th left foot.

palps. Two pairs of eyes are present. The palps are smooth, ovoid and massive. The longest tentacular cirrus reaches the 6th setigerous segment, when bent backwards.

The proboscis (Fig. 13, B & C) bears a pair of transparent yellowish-brown jaws and only soft paragnaths on the oral and maxillary rings. In the maxillary ring, group I is devoid of papillae; II has a cluster of 8-9 conical papillae arranged in about 3 rows; III has about 15 conical papillae arranged in about 3 rows and group IV has 11-13 conical papillae arranged in 2-4 rows. In the oral ring, group V is devoid of papillae and group VI has 1 large papilla. Groups VII-VIII consist of a single row of 4 large conical teeth.

The first foot (Fig. 13, D) has only one long conical lobe in the dorsal ramus. In the ventral ramus, the tip of the setigerous lobe has a small triangular anterior lobe and a similar posterior lobe. The ventral ligule is large and is nearly equal in length to the ventral cirrus. The aciculum is black. Above and below it are a group of hemigomph spinigers (Fig. 13, E) with long terminal pieces. Below these are a group of hemigomph spinigers with short terminal pieces. The second foot is similar to the first, except for the larger number of setae.

The third foot (Fig. 14, A) has, in addition to the triangular dorsal ligule, two other well developed lobes in the dorsal ramus. They are cylindrical. The dorsal ramus has an aciculum and about 6 homogomph spinigers. The lobes of the ventral ramus are similar to those of the first foot. There are about 5 hemigomph spinigers above the aciculum and about 13 below it.

In the 15th foot (Fig. 13, I) the base of the dorsal cirrus and the dorsal ligule possess glandular masses (clotted blood?). The dorsal ligule is triangular and flattened. The other two lobes of the dorsal ramus arise from a common, somewhat elongated stem. There are about 12 homogomph spinigers in the dorsal ramus. The ventral ramus has two small lobes at the end of the setigerous lobe and a ventral ligule. There are about 6 hemigomph spinigers above the aciculum, one nearly heterogomph spiniger (Fig. 13, F & G) below it followed by about 10 nearly heterogomph falcigers. These falcigers have short terminal pieces ending in blunt tips (Fig. 13, H).

In the 20th foot (Fig. 14, B) the dorsal ligule is enlarged, triangular, foliaceous and has glandular masses within it. The ventral ramus has 3 homogomph spinigers and 4 nearly heterogomph falcigers above the aciculum and about 8 nearly heterogomph falcigers below the latter.

In the 30th foot (Fig. 14, C), the ventral ligule is elongated, longer than the ventral setigerous lobe. The dorsal ligule is foliaceous and the base of the dorsal cirrus is swollen. Of the two other lobes in the dorsal ramus, the more dorsal one is slender and reduced while the other is triangular. The latter, the base of the dorsal cirrus and the dorsal ligule, have glandular patches. The dorsal ramus has about 7 homogomph spinigers. The ventral ramus has about 3 hemigomph spinigers and 7 hemigomph falcigers while below it there are about 5 nearly heterogomph falcigers.

Falcigers disappear completely by the 46th foot. In the 50th foot (Fig. 14, D), the base of the foot itself is longer than in the preceding feet. There are glandular masses in

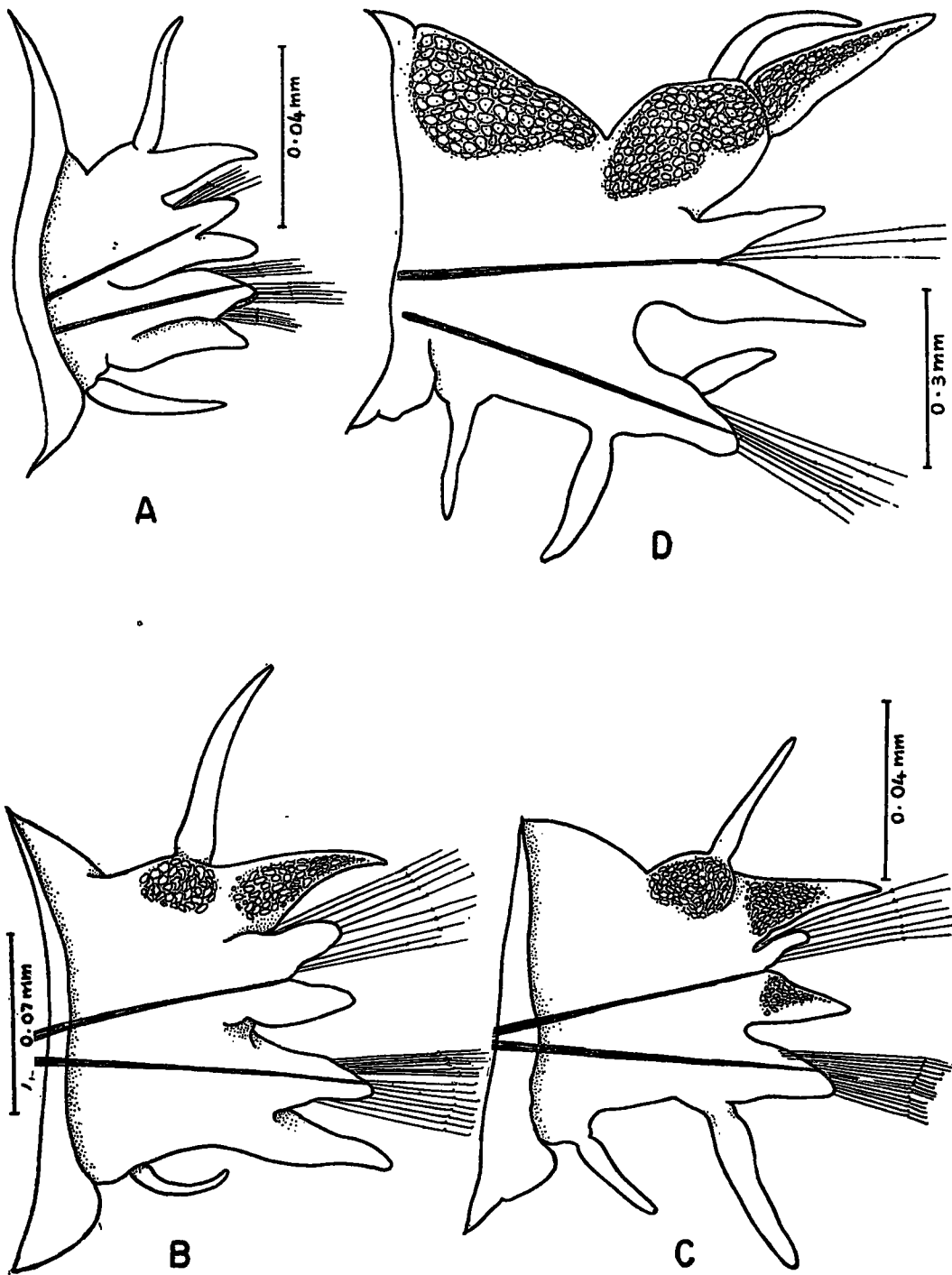


FIGURE 14. *Leonnates decipiens* Fauvel, var. *manilensis* nov. A—D. A, Anterior view of the 3rd left foot; B, Anterior view of the 20th left foot; C, Anterior view of the 30th left foot; D, Anterior view of the 50th left foot.

the dorsal part of the base of the foot, the swollen base of the dorsal cirrus and the dorsal ligule. The dorsal and ventral setigerous rami are somewhat elongated. In the ventral ramus, the posterior lobe is elongated and points dorsally. The ventral ligule is slender and points downwards rather than outwards as in the anterior feet. The dorsal ramus has about 3 homogomph spinigers. The ventral ramus has about 17 homogomph spinigers above the aciculum and 2 nearly heterogomph spinigers below it. Falcigers are absent.

The posterior lobe of the ventral ramus is lacking from about the 5th to the 35th feet. It reappears as a small bulge on the 36th foot and becomes longer in the succeeding feet. From about the 39th foot, it is a conspicuous cirriform process.

In the 75th foot there are still 3 homogomph spinigers in the dorsal ramus. In the ventral ramus, there are 2 homogomph spinigers and one hemigomph spiniger above the aciculum and only 4 hemigomph spinigers below it. Falcigers are absent.

The anal cirri are a pair of slender filaments about 2.25 mm. long, situated below the anal segment.

The worms from Manila are similar to *L. decipiens* Fauvel 1929 with regard to the feet, glandular masses and setae. The proboscoidal armature is, however, different. According to Fauvel (1953), the papillae of the oral ring are smaller than those of the maxillary ring. In the present specimens, there are 4 large conical teeth in groups VII—VIII and 1 large papilla in group VI; they are all larger than the papillae of the maxillary ring. The counts of papillae for the other groups are also different. *L. jousseaumi* Gravier 1898 (= *L. virgatus* (Grube) 1878 according to Hartman 1959) is distinguishable from *L. decipiens* and the present variety since it possesses falcigers in the dorsal ramus.

Type specimens : Holotype. University of Ceylon, RTS. 21.

Paratypes. British Museum (Natural History).

Family EUNICIDAE Savigny, 1818

Eunice antennata (Savigny 1820)

(Fig. 15, A—H; Fig. 16, A—D)

Eunice antennata (Savigny).

Fauvel 1953, p. 240, Fig. 118, f—g; Willey 1905, p. 280; Fauvel 1932, p. 138.

One complete specimen was collected by Mr. Lichauco from Hundred Islands, Lingayan Gulf, Luzon. It is 112.0 mm. long, 5.0 mm. broad and has 116 setigers.

The prostomium (Fig. 15, A) is bilobed. The five prostomial tentacles, the pair of tentacular cirri on the second apodous segment, the dorsal cirri and the two anal cirri are moniliform. The first apodous segment is about three and a half times as long as the second apodous segment.

The dental apparatus (Fig. 15, B) is light yellow in colour except for the black colouration of the ventral aspects of the anterior edentate plates, the junctions between the

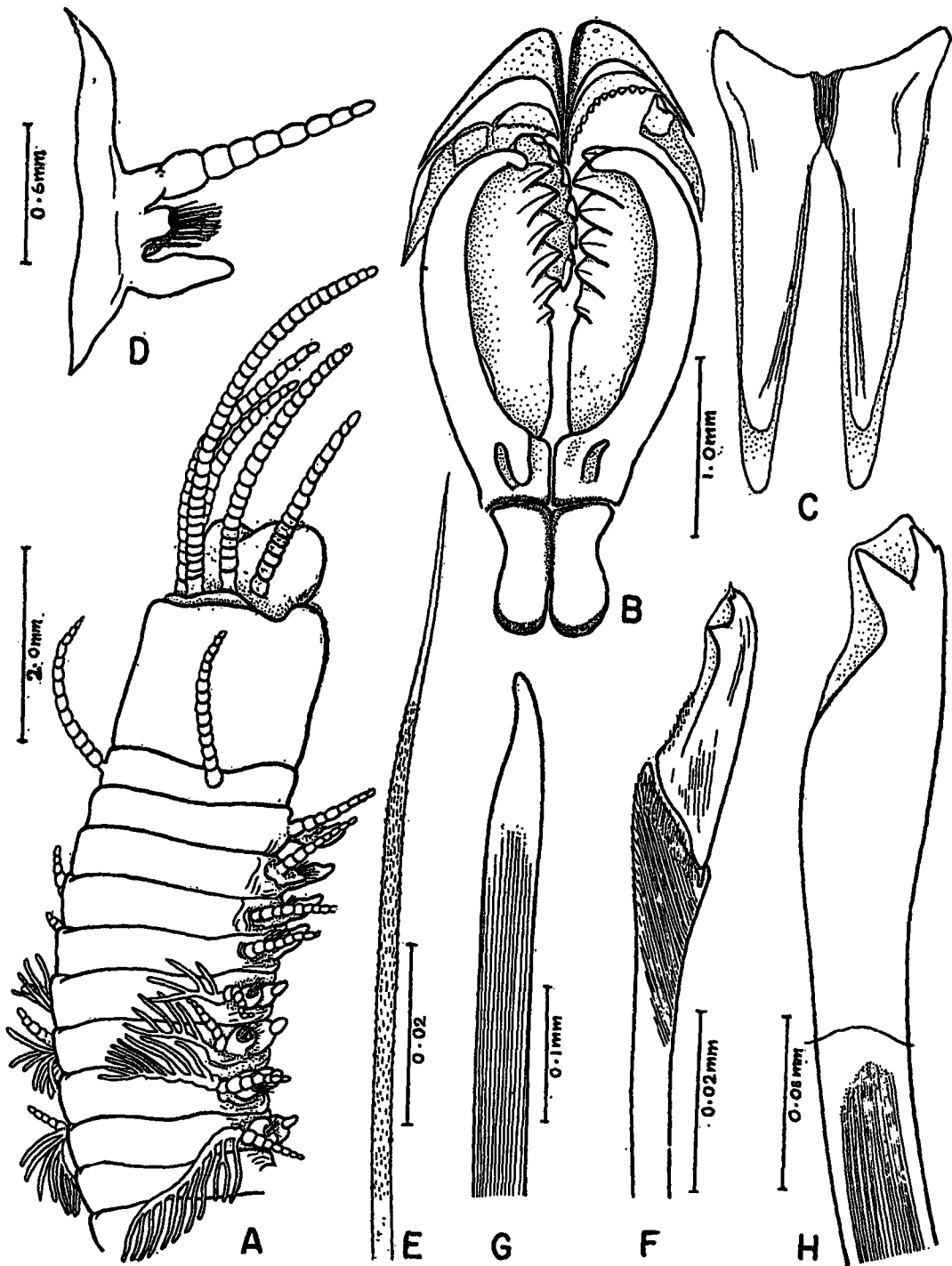


FIGURE 15. *Eunice antennata* Savigny. A—H. A, Right dorso-lateral view of the anterior end; B, Maxillary part of the dental apparatus; C, Mandibles of the dental apparatus; D, Posterior view of the 1st right foot; E, Capillary seta from the ventral ramus of the 1st foot; F, Compound falciger from the 1st foot; G, An aciculum; H, Ventral hook.

forceps and its carrier, the junction between the carriers of the two sides and the posterior borders of the carriers. The dental formula is as follows: Maxilla I (forceps) = 1 on each side; II = 6 on the left and 6 on the right; III (Azygous plate) = 6 on the left; IV = 7 on the left and 10 on the right. There are two Λ -shaped anterior edentate plates and two small square edentate plates. The latter have minutely serrated edges and are situated laterally between the anterior edentate plates and the forceps. The two halves of the mandible are joined anteriorly by a distensible connection. Like the maxillae, they are light yellow in colour but their upper surfaces are white and calcareous.

The setae of the first foot (Fig. 15, D) are arranged in two bundles. A bundle of simple capillaries goes to the base of the dorsal cirrus. The ventral setal bundle consists of (a) simple capillaries with minute hair-like processes (Fig. 15, E) dorsally, (b) compound falcigers below them with the shaft serrated and striated near the articular joint and the terminal pieces hooded and tridentate, the third tooth being small (Fig. 15, F). (c) two translucent brown acicula with curved tips (Fig. 15, G). This is the usual arrangement of setae in the feet. However, in the 57th, 64th and 70th feet, in this specimen, there are three acicula instead of two.

Ventral hooks commence on the 22nd setiger and there is one in each succeeding foot. They are yellowish brown in colour, their tips are bidentate and hooded and their shafts are darker coloured up to some distance from their tips (Fig. 15, H).

Comb setae (Fig. 16, A) commence on the 65th setiger and consist of a smooth shaft, an expanded comb-plate which bears minute hair-like processes and about 15–20 slender teeth. The end tooth of one side is longer than the other teeth.

Gills commence on the 5th setiger (Fig. 16, B) with 4 filaments. The 6th gill has 6 filaments, the 7th has 9, the 8th has 10 (1 filament of which is forked), the 10th has 12, the 11th–20th or so have 13 filaments (Fig. 16, C) and decrease thereafter. They become more bushy again posteriorly, although the number of filaments does not exceed 10, till about 15 setigers from the end of the worm, whence they suddenly decrease in number and size. On the 19th left foot, from the posterior end, there are 3 pectinate gills, each with 10 filaments arising from the base of the single dorsal cirrus. This is an aberrant condition. Gills are present up to the end of the body. The anal segment bears two long anal cirri (Fig. 16, D).

Distribution: The Philippines, Indo-China, India, Ceylon, Pacific Ocean, Persian Gulf, Red Sea.

Genus *MARPHYSA* Quatrefages, 1865

Marphysa graveyi Southern 1921

Marphysa graveyi Southern.

Southern 1921, p. 617, pl. xxiv, fig. 13; Fauvel 1932, p. 142; Fauvel 1953, p. 246.

Numerous specimens were collected from milkfish ponds in the following places in the Philippines: Dagupan City, Malabon and Dagat-dagatan in Luzon. They were observed in Iloilo City, Cebu and Bacolod in the Visayas, and Zamboanga and Davao in Mindanao.

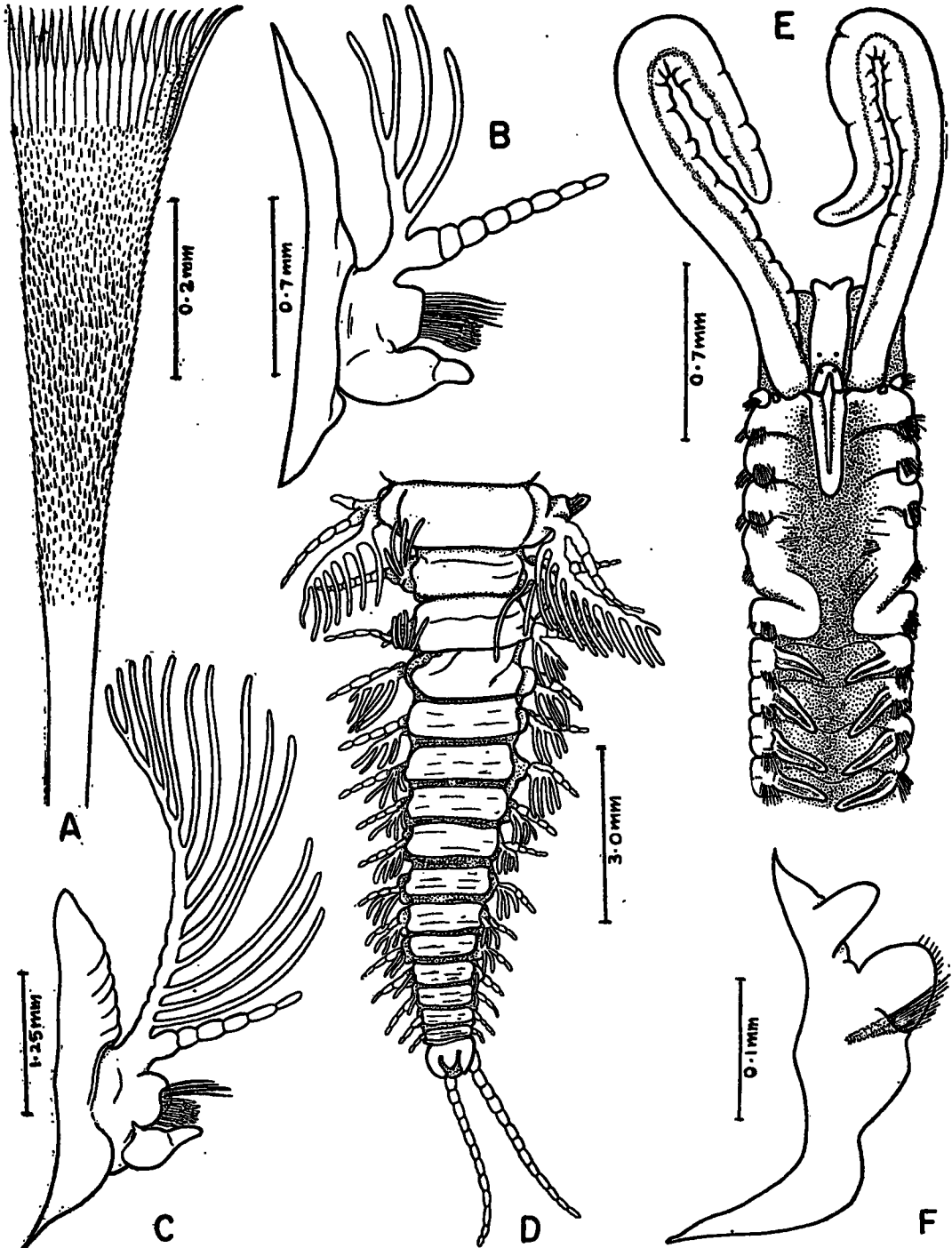


FIGURE 16. *Eunice antennata* Savigny, A—D. A, Comb seta; B, Posterior view of the 5th right foot. C, Anterior view of the 15th right foot; D, Dorsal view of posterior end. *Polydora cavitensis* sp. nov.; E—F. E, Dorsal view of anterior end; F, Anterior view of the 1st left foot.

They agree with Southern's (1921) and Fauvel's (1953) descriptions. The largest specimen in the collection is 290 mm. long and 6.0 mm. wide. The smallest is 26.0 mm. long and 3.0 mm. wide. In the former, gills commence on the 27th setiger, maximum number of filaments in a gill is 10 and the ventral hooks commence on the 43rd foot. In the smallest specimen, gills commence on the 16th setiger, the maximum number of filaments on a gill is 5 and ventral hooks commence on the 19th setiger. In the intermediate specimens, the gills and ventral hooks commence further away from the anterior end as the animal increases in length and the maximum number of gill filaments also increases.

Diameter of the eggs from the jelly-like cocoons collected from Dagupan city is 0.2 mm. Several metatrochophores were also measured. Their average length is 0.28 mm. They do not possess eyes although the 1st pair of feet are formed and possess 2 or 3 setae. The larvae agree with the description given by Southern (1921) for *M. gravelyi*.

Many milkfish ponds in the Philippines are infested with this burrowing polychaete. The large, jelly-like egg-cocoons of this worm, which are often present in considerable numbers, are responsible for high milkfish fry mortalities in nursery ponds. The fish accidentally dart into them when disturbed and, being unable to extricate themselves from the stiff jelly-like masses, die within them. Fish farmers regularly collect these cocoons and throw them on the bunds to be destroyed by the heat of the sun. Various chemicals are often used to destroy the worms that shelter within their burrows in the pond bottom (Pillai, 1962).

Family **SPIONIDAE** Grube, 1850

Genus **POLYDORA** Bosc, 1802

Polydora cavitensis sp. nov.

(Fig. 16, E -F; Fig. 17, A -G)

Six complete specimens and several anterior and posterior fragments were collected from the Government Oyster Farm in Binakayan, Cavite, Manila Bay. They were found among oysters. The longest uncoiled specimen is 15.0 mm. long and 0.7 mm. wide.

The pigmentation, in alcohol, is as follows: A triangular reddish-brown patch is seen on the dorsum of each segment, particularly the middle and posterior segments. Each palp has two transverse brown bands, one towards its middle and the other towards its distal end. The anal plate has two brown patches, one on each anterior border. In general, the body has a greenish tinge in its posterior portion.

The prostomium (Fig. 16, E) is notched in front and has two antero-lateral horn-like processes. A caruncular prolongation is present which is nearly as long as the prostomium, and extends to the end of the 3rd setiger. It bears a longitudinal mid-dorsal ridge and an anteriorly directed occipital tentacle. Two pairs of eyes are present, the anterior

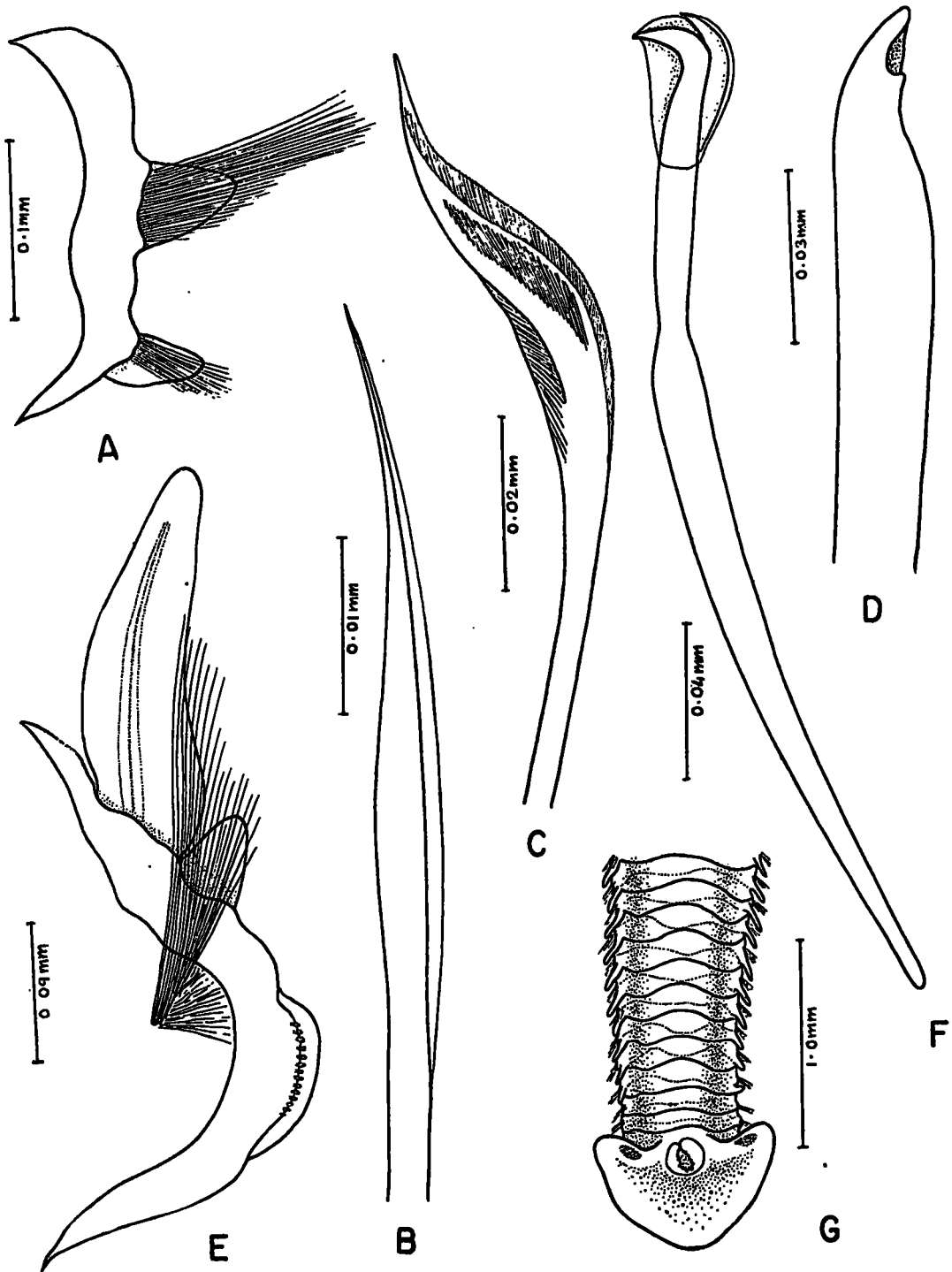


FIGURE 17. *Polydora cavitensis* sp. nov., A—G. A, Anterior view of the 2nd left foot; B, Seta from the ventral ramus of the 2nd foot; C, Dorsal companion seta from the 5th setiger; D, Stout seta from the 5th setiger. E, Anterior view of the 7th left foot; F, Neuropodial hook from the 7th foot; G, Dorsal view of the posterior end of the worm.

pair being located near the posterior end of the prostomium and the posterior pair on a rounded lobe between the prostomium and its posterior caruncular extension. Two long, stout, grooved palps are present.

The first foot (Fig. 16, F) has a small dorsal lamella and a larger ventral lamella. Notosetae are absent. Neurosetae are slender and nearly capillary. Close examination shows that the latter possess very narrow wings.

In the second foot (Fig. 17, A), the dorsal and ventral lamellae are larger. Notosetae consist of almost capillary setae dorsally and setae with narrow wings ventrally. Neurosetae have distinct wings (Fig. 17, B) and the more dorsal ones are longer than the ventral ones. The 4th foot is similar but the noto- and neurosetae are shorter.

The 5th segment (Fig. 16, E) is modified. The dorsal ramus has (i) a group of about 5 small simple setae with spatulate and curved distal portions (Fig. 17, C); (ii) a somewhat curved row of about 6–13 dark-brown, simple, stout setae with notched tips (Fig. 17, D). The ventral ramus has a small bundle of setae similar to those shown in Fig. 17, C. Dorsal and ventral lamellae are absent on the 5th setiger but are present from the 6th to about the 13th or 14th setiger after which they are again absent. In the 6th setiger, which is also modified anteriorly, the dorsal and ventral setae are similar to those of the 4th setiger.

Gills commence on the 7th setiger (Fig. 17, E) and are present up to the end of the body. In the 7th foot (Fig. 17, E), the gill is large and tongue-like as in the succeeding feet. The notosetae are similar to those in the 4th foot. Neuropodial hooks also commence on the 7th setiger and there are about 10–16 arranged in a dorso-ventral row in front of the membranous lamella. Each such hook (Fig. 17, F) has a bidentate hooded tip and a waist on the shaft. The setae of the succeeding feet are similar to those of the 7th foot.

The pygidium (Fig. 17, G) has a flattened triangular anal plate with two conspicuous dark brown or reddish brown pigment patches, one on each antero-lateral aspect. The anus is situated dorsally.

In *Polydora hornelli* Willey 1905, which has the closest resemblance to this species, there are no eyes, the caruncle lacks an occipital tentacle and the neuropodial hooks have a neck (Willey 1905, Southern 1921, Fauvel 1953). Its pygidium is unknown (Fauvel 1953). In *P. ciliata* (Johnston) 1838 the gills are present till the 10th penultimate segments (Fauvel, 1953). In *P. hoplura* Claparède 1878, gills are absent from the 10th–23rd last segments and a nuchal tentacle is absent. In *P. nuchalis* Woodwick 1953, companion setae of the 5th foot are plumose and posterior neuropodial hooks are absent. The pygidium is disk-like. In *P. rickettsi* Woodwick 1961, the prostomium is rounded anteriorly and lacks a nuchal tentacle. The companion setae of the 5th setiger are plumose and the pygidium is disk-like and notched.

Type specimens: Lectotype and 4 paratypes. University of Ceylon, R.T.S. 22.
Paratypes. British Museum (Natural History).

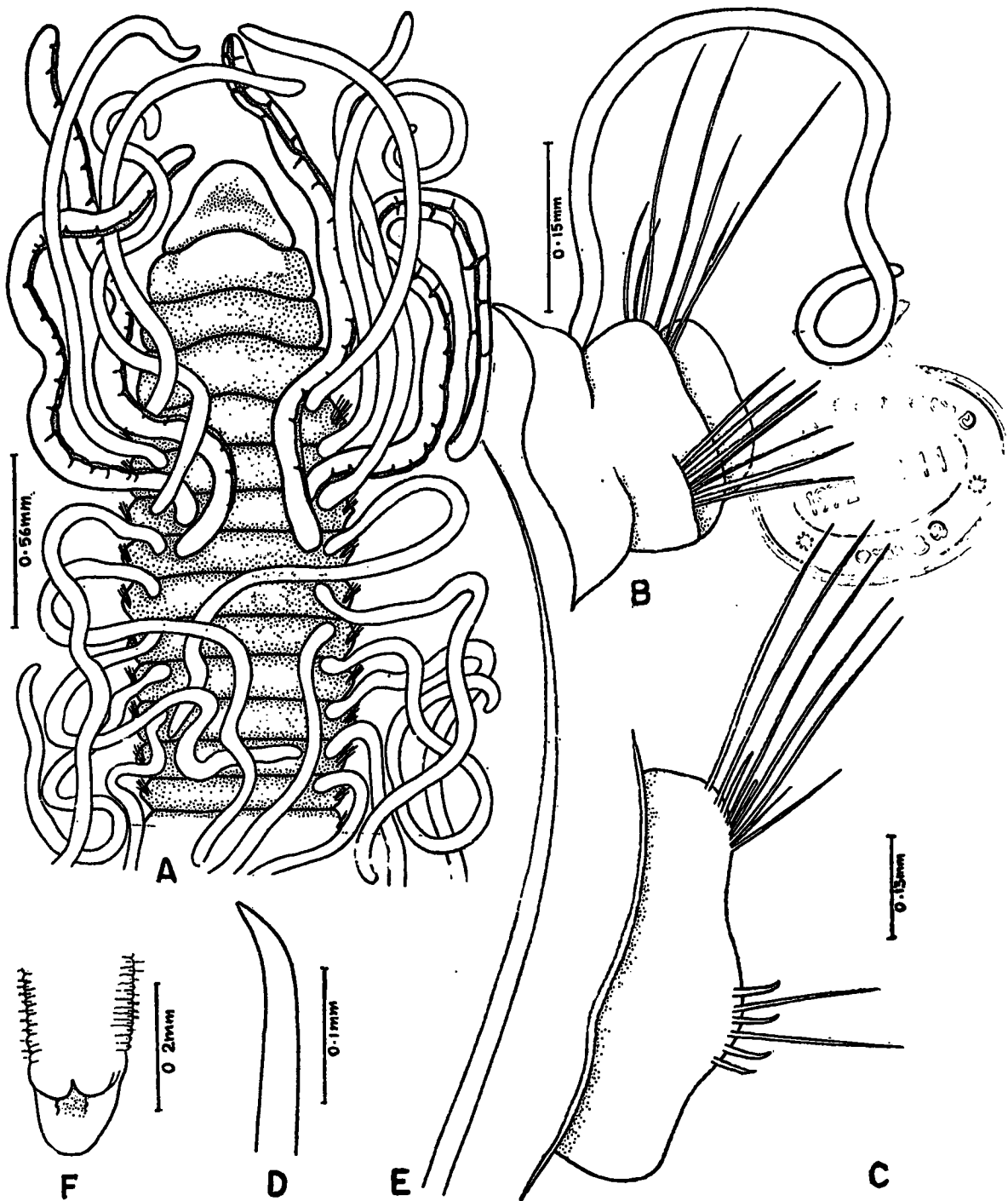


FIGURE 18. *Cirriformia chrysodermoides*, sp. nov., A—F. A, Dorsal view of the anterior end; B, Anterior view of the 1st left foot; C, Anterior view of the 15th left foot; D, Tip of an acicular seta from the ventral ramus of the 15th foot; E, Simple tapering blade-like seta from the 15th foot; F, Dorsal view of the posterior end of the worm.

Family CIRRATULIDAE Carus, 1863

Genus CIRRIFORMIA Hartman, 1936

(= *Audouinia* Quatrefages, 1865).

The name *Audouinia* proposed by Costa in 1934 for an amphipod is valid. Hence Hartman replaced it with *Cirriformia* (Hartman 1959, Day 1961).

Cirriformia chrysodermoides sp. nov.

(Fig. 18, A – F)

Several specimens were collected from the Government oyster farm in Manat, Dagupan City, Luzon. Most of them are coiled and difficult to measure with accuracy. One specimen which is not coiled is 20.0 mm. long, 1.1 mm. broad and has approximately 140 setigers.

The body is slender and somewhat cylindrical. The somewhat flattened triangular prostomium (Fig. 18, A) lacks palps, tentacles and eyes. It is followed by three achaetous segments which are also devoid of any other outgrowths.

Simple, slender, lateral gills are present from the first setiger. They are found on the anterior half to two-thirds of the body. The rest of the body is devoid of gills.

There are altogether only 2 pairs of grooved dorsal tentacles. One pair arises from the 3rd setigerous segment and the other from the 4th (Fig. 18, A). They are about one and a half times as broad as the lateral gills. All the specimens examined showed this condition.

The 6th foot has about 8 capillary setae in the dorsal ramus. In the ventral ramus, there are about 3 simple blades and about 3 simple acicular hooks which alternate with each other. The acicular setae (Fig. 18, B) are transparent like the other setae and have curved tips. The 7th foot is similar. It has about 4 acicular hooks and 3 blade-like setae.

In the 15th foot (Fig. 18, C), the dorsal ramus has a few short capillaries and a truncated hook-like seta. The ventral ramus has 4 acicular setae (Fig. 18, D) and 2 simple tapering blades (Fig. 18, E). The posterior feet are similar but the ventral acicular hooks are reduced to 3 and there are fewer capillaries in the dorsal ramus.

The anus is situated dorsally and has a posteriorly directed ventral lip (Fig. 18, F).

Cirriformia chrysoderma (Claparède) 1868 is similar to the present species in having few dorsal tentacles (2 or 3 pairs) but its notopodia and neuropodia possess only slender capillary setae (Imajima and Hartman, 1964) and thus differs from the present species.

Type specimens : Lectotype and 4 Paratypes. University of Ceylon, RTS. 23.
Paratypes. British Museum (Natural History).

Family OPHELIIDAE Malmgren, 1867

Genus POLYOPHTHALMUS Quatrefages, 1850

Polyophtalmus pictus (Dujardin) 1839*Polyophtalmus pictus* (Dujardin)

Fauvel 1927, p. 137, Fig. 48, I—O; Fauvel 1919, p. 437; Fauvel 1953, p. 360, Fig. 187, L—O; Hartman 1956, p. 294; Hartman 1959, p. 434; Imajima and Hartman 1964, p. 309; Rioja 1954, p. 273; Tebble 1959, p. 27.

Polyophtalmus australis Grube.

Grube 1878, p. 196, Taf. X, Fig. 3.

Numerous specimens were collected from the oyster farm at Manat, Dagupan City, Luzon. The bamboo oyster spat collectors and the oysters themselves are often covered with sponges, polyzoa, colonial ascidians and other encrusting organisms. Within these encrustations, *P. pictus* is found in teeming numbers.

The colouration of the specimens is highly variable. The largest specimen in this collection is 14.0 mm. long and 1.0 mm. wide.

Distribution: Cosmopolitan. Pacific, Indian and Atlantic Oceans and the Mediterranean Sea. Australia, China, Japan, the Philippines, India, Ceylon, Africa, France, Italy, Israel, Bermuda, Tortugas, Gulf of Mexico and Bay of Biscay.

Family CAPITELLIDAE Grube, 1862

Genus BRANCHIOCAPITELLA Fauvel, 1932

Thorax with nine setigerous segments of which the anterior seven have only capillary setae in the noto- and neuropodia. The notosetae of the eighth and ninth setigers consist of a few large spines, modified to form part of a dorsal copulatory apparatus. Noto- and neurosetae of the abdominal segments consist of hooded hooks. Abdominal gills are ventral and cirriform. (Emended).

Branchiocapitella singularis Fauvel, 1932

(Fig. 19, A—F).

Branchiocapitella singularis Fauvel.

Fauvel 1932, p. 197, pl. VII, figs. 9—14; Fauvel 1953, p. 371, Fig. 193, a—f; de Silva (MS. in press).

Nine specimens were collected from the muddy bottom of a milkfish pond in Surabaya, East Java. Six of them have their gill regions posteriorly while the posterior regions are missing in the others. A complete specimen is 80.0 mm. long, 1.5 mm. wide in the region of the 6th setiger and has about 215 setigers.

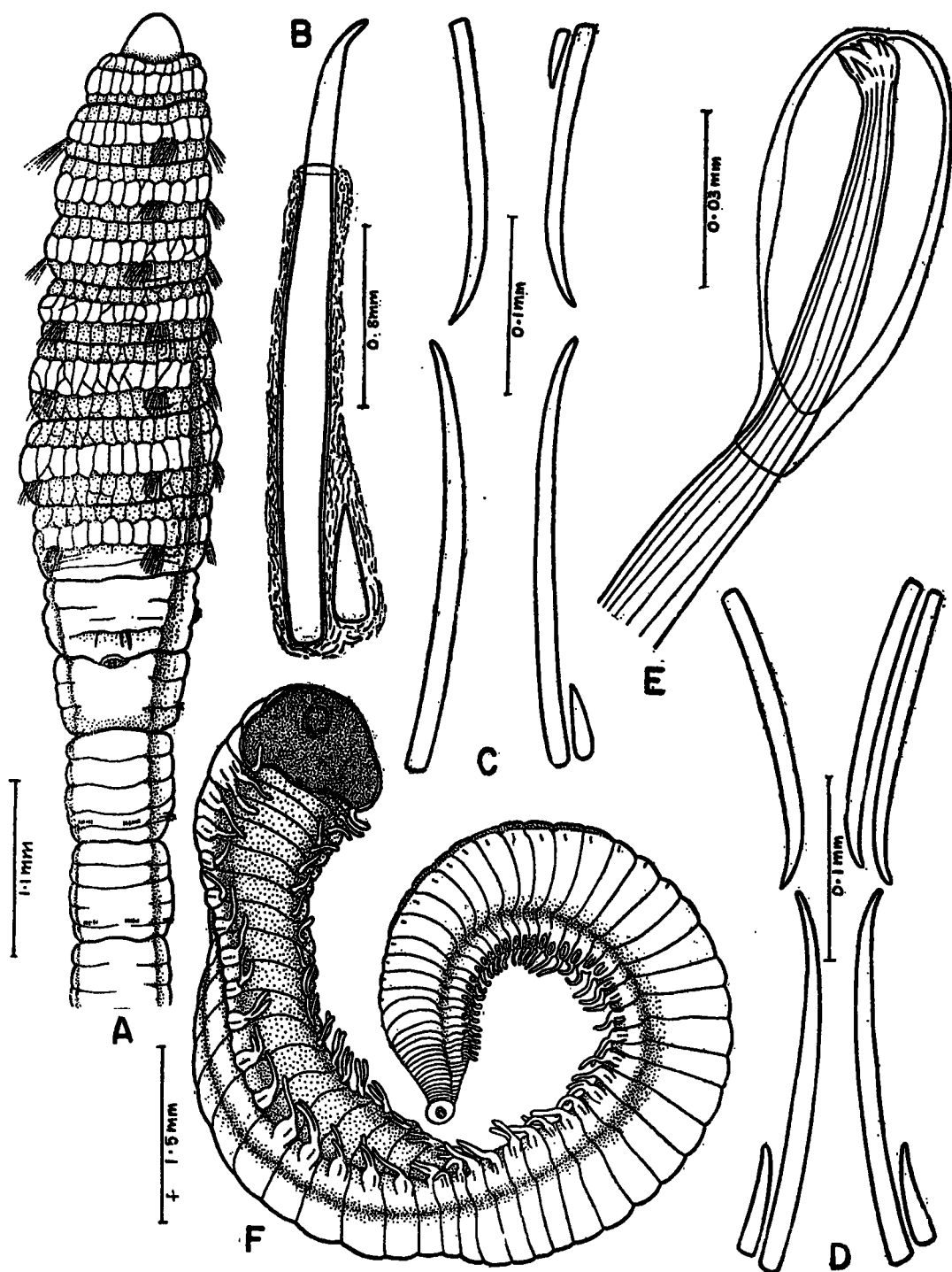


FIGURE 19. *Branchiocapitella singularis* Fauvel, A—F. A, Dorsal view of the anterior end; B, Spine from the copulatory apparatus enlarged to show the sheath surrounding it; C, Copulatory spines of a specimen (8th setiger towards top of page); D, Copulatory spines from another specimen (8th setiger towards the top of the page); E, Hooded neuropodial hook from the 8th foot; F, Posterior end of the worm showing the ventral gills and the anal segment.

The body is buff to greyish brown in formalin. The skin of the first 9 setigers (thorax) is shiny and somewhat iridescent but that of the succeeding segments is dull. Further, the skin of the peristomium, the first six setigers and about two thirds of the 7th setiger is tessellated (Fig. 19, A).

The abdominal segments have brown pigment spots dorsally and ventrally, somewhat more densely in the form of a narrow band in front of and another behind the setigerous bundles. This pigmentation is most prominent in the middle third of the body in most of the specimens. Ventrally, they are also densely distributed along the mid-ventral line of these setigers. The pigment spots appear as isolated bodies projecting from the deeper layers of the skin towards the epidermis.

The body is slender, filiform, but somewhat expanded in the thorax (Fig. 19, A). The prostomium lacks eyes and its tip is rounded. The peristomium and all the thoracic setigers are triannulate. The triannulate condition is sometimes obscured in contracted specimens where they may appear biannulate. The sixth setigerous segment is the widest segment of the body.

The first 7 thoracic setigerous segments bear capillary setae in both dorsal and ventral rami. In the 1st - 5th they are arranged in two transverse rows while in the 6th and 7th they are in three transverse rows.

On the 8th and 9th thoracic setigers the notosetae are modified and incorporated in the copulatory apparatus (Fig. 19, A). In the 8th setiger there are typically two pairs of long, stout setae, one pair on each side. They originate from the groove marking the posterior border of the second annulus of that segment. They are directed backwards and reach the 8th/9th intersegmental area when the segments are contracted. The modified notosetae of the 9th setiger are located in an oval aperture in the intersegmental position 8/9; they are also typically 4 in number. The copulatory spines in both setigers are provided with sheaths (Fig. 19, B).

The number and length of the spines of the copulatory apparatus is not constant. One specimen has all eight spines. In the 8th setiger, the left lateral spine is reduced while the left medial and both right spines are equally long and well developed. In the 9th setiger, the left and right lateral spines are reduced in size while the medial spines of both sides are long and well developed.

In another specimen (Fig. 19, C), the 8th setiger has both lateral spines well developed but the left medial spine is lacking and the right medial spine is reduced. In the 9th setiger of the same worm, the left lateral spine is absent, both medial spines are well developed and the right lateral spine is reduced. In the 3rd specimen (Fig. 19, D), the 8th setiger lacks the left lateral spine but the other three are well developed. In the 9th setiger, both medial spines are well developed but the lateral ones are reduced. In the fourth specimen, all four spines are well developed in the 8th setiger but there are only two (medial) well developed spines in the 9th. In another specimen, only a well developed right medial spine is present in both setigers.

Neurosetae of the 8th and succeeding setigers and notosetae of the 10th and succeeding setigers are hooded hooks (Fig. 19, E). They possess an elbow-like bend in the shaft and

bear many teeth at their distal ends. The striations along the length of the shaft run parallel to one another till near the distal end.

Gills are *ventral* (Fig. 19, F). They appear to commence more posteriorly in older specimens. In the smallest specimen they commence on the 64th setiger. In five other specimens they commence on the 80th, 82nd, 98th, 108th and 110th setigers. In the specimen with gills from the 98th setiger, gills with 2 filaments each commence from the 105th setiger. In the specimen with gills from the 108th setiger, gills with two filaments are present from the 105th setiger. The gills in this region do not all possess two filaments. Gills with single filaments are also found among them. In the posterior 30 setigers or so gills consist of only single filaments.

The anus is situated posteriorly on a faintly bilobed anal segment (Fig. 19, F). There is a formative region of about 10 segments without gills before the anal segment.

During the present investigation it was found that although Fauvel's original (1932) and subsequent (1953) generic definitions of *Branchiocapitella* state that the latter possesses "dorsal cirriform gills" they are *really ventral* in the material from East Java. If these specimens are really different from *B. singularis* Fauvel they have to be included under a separate genus. However, I have also examined Dr. P. H. D. H. de Silva's collection of *B. singularis* from the Jaffna Lagoon, Ceylon, reported in a paper now in press and my own collections of *B. singularis* from the Negombo Lagoon, Ceylon, and feel that this is unlikely. The gills of all these specimens are *ventral*. Fauvel's (1932 and 1953) figures of the gill region would therefore appear to have been drawn and interpreted upside down. Often the specimens are so highly coiled posteriorly that it is possible to encounter difficulties in discerning the dorsal and ventral aspects in this region.

Dr. de Silva in his paper now in press has pointed out a discrepancy between the hooks figured by Fauvel (1932 and 1953) and the hooks of his specimens of *B. singularis*. Although Fauvel figured them as bidentate, de Silva's specimens have many teeth in their hooked setae. The specimens from East Java and the Negombo Lagoon (Ceylon) agree with de Silva's findings.

Family **TEREBELLIDAE** Malmgren, 1867

Sub-family **THELEPINAE** Hesse, 1917

Genus **THELEPUS** Leuckart, 1849

Thelepus binakayanensis sp. nov.

(Fig. 20, A–D; Fig. 21, A).

Three specimens were collected from the Government oyster farm at Binakayan, Cavite, Manila Bay. The largest specimen is 95.0 mm. long (excluding the tentacles) and 6.5 mm. wide in the widest region of the thorax. The tubes are somewhat membranous and plastered with minute fragments of oyster shells and fine sand.

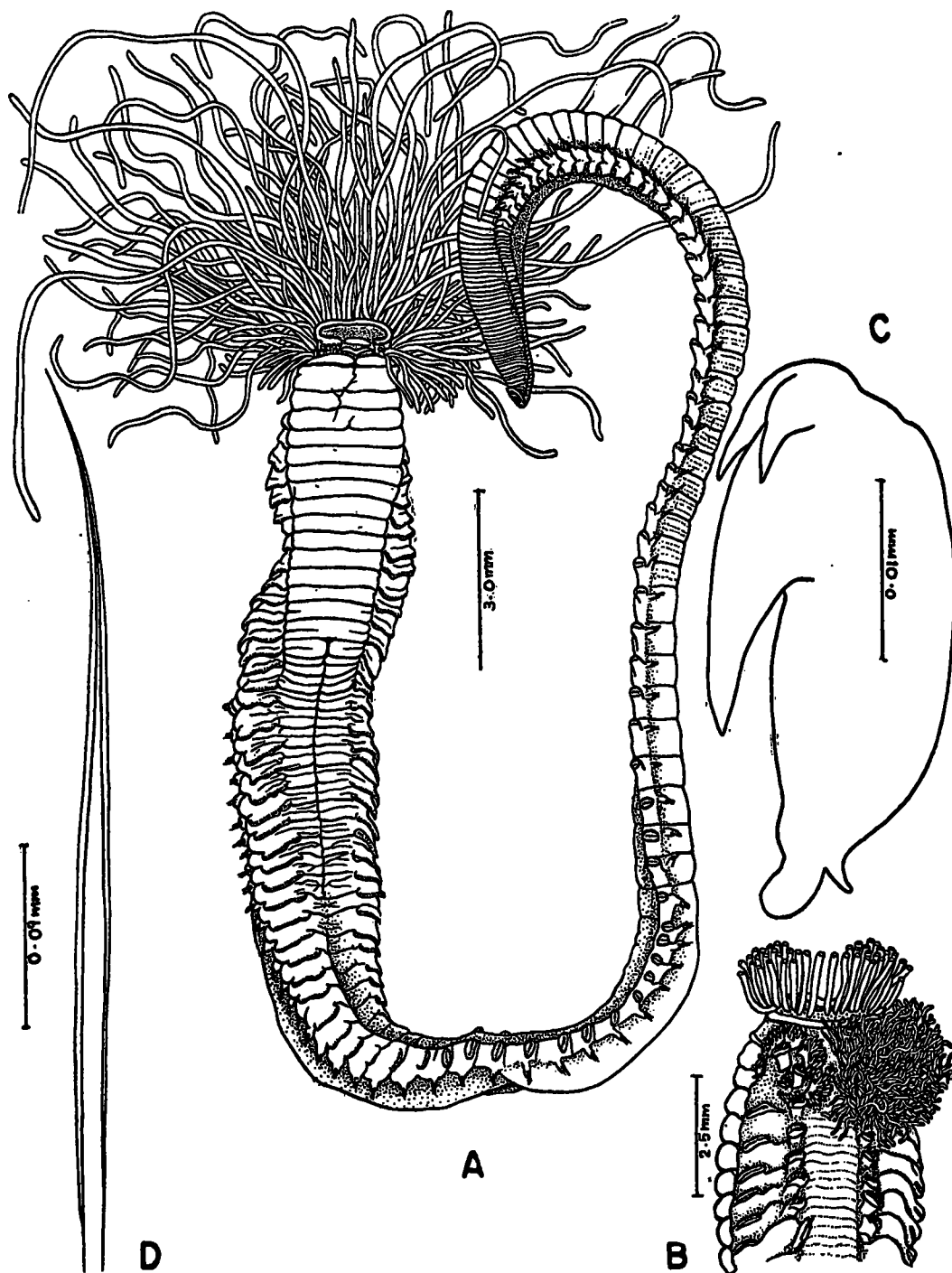


FIGURE 20. *Thelepus binakayanensis* sp. nov., A—D. A, Whole worm with ventral view of the thorax; B, Dorsal view of the thorax; C, Uncinus from the 2nd thoracic uncinigerous torus; D, Notoseta from the 1st thoracic setal fascicle.

The body is light buff coloured in formalin. A violet pigment spot is present at the dorsal end of each uncinigerous torus in the thorax and anterior abdomen. Each such pigment spot is composed of many rounded pigment cells.

The first segments of the thorax are devoid of lateral lobes. A large horse-shoe shaped dorsal lip and a short ventral lip surround the mouth. Below the ventral lip there is another process which is V-shaped in end view (Fig. 20, A). There are three pairs of gills. Each gill consists of several filiform filaments arising in 2-4 transverse rows. The three gills on each side arise anterior to the first, second and third setigerous lobes, respectively.

The first uncinigerous torus occurs on the 3rd setigerous segment. The uncini are arranged in a single row in each torus and they are all of one kind in both the thoracic (Fig. 20, C) and abdominal (Fig. 21, A) tori. The anterior end or prow of each uncinus is a curved and prominent spine which is directed ventrally while the process or button by which the anterior end is attached is comparatively large, nearly rectangular in side view and directed antero-dorsally. The posterior end of the uncinus bears a main fang, which reaches slightly more than half the total length of the uncinus, and there are only two smaller teeth above it.

The uncini of the anterior third of the body (thoracic region) are borne along the edges of prominent flap-like lobes, each of which overlaps the succeeding segment. Those of the middle third of the body are borne on slightly raised pads while those of the succeeding region are borne on raised square pinnules. The uncinigerous tori of the last 15-20 segments are not developed.

The dorsal setae are all winged capillaries (Fig. 20, D). They arise from stout raised cylindrical lobes terminating in oval setigerous processes in the thorax (Fig. 20, B). In the rest of the body they are borne on slender cylindrical setigerous lobes. These setigerous lobes are not developed in the last 15-20 setigers.

The ventral scutes (Fig. 20, A) are wider than long. They become narrower posteriorly and disappear by about the 32nd setiger. The first scute is divided by a median groove into right and left halves which are triangular and narrow. The second scute is double as indicated by the lateral outline. The 3rd-14th scutes are single, the more posterior ones showing a notched lateral outline foreshadowing the transverse furrows of the succeeding scutes. The 15-17th scutes or so show transverse furrows which do not reach the centre. From about the 17th scute there is a mid-ventral groove dividing the scutes into right and left halves. From about the 17th-24th setigers transverse grooves divide each scute into about 4 sections. The more posterior scutes are divided by ramifying grooves into irregular areas. The regions between the setal fascicles and the uncinigerous tori of the thorax, particularly anteriorly, are highly glandular.

The abdomen commences from about the 32nd setigerous segment. From the 32nd to about the 47th setiger there is a wide ventral longitudinal groove, after which the ventral body wall is flat. The posterior end is swollen and has a deep mid-ventral groove (Fig. 20, A). The many segments of the pygidial region are narrow and their noto- and neuropodia are not developed. The anus is postero-dorsal.

As stated by Day (1955), the species of *Thelepus* are difficult to distinguish. Day (1955), after studying a large series of specimens in the British Museum found that characters such as the arrangement of the branchial filaments, the length of the abdominal segments

and the size of the uncinigerous pinnules are of little value for this purpose. On the other hand, the number of branchiferous segments with notosetae, the number of branchiae, the number of rows of uncini and, especially, the structure of the uncinus itself are of systematic importance.

The uncini of *T. plagiostoma* Schmarda 1861, *T. triserialis* Grube 1855, *T. comatus* Grube 1866 and *T. pequenianus* Augener 1918 as described and figured by Day (1955) are different from those of the present species. The uncini of *T. japonicus* Marenzeller 1884 and *T. setosus* (Quatrefages) 1866 are also different (Imajima and Hartman 1964). None of these species have a spine-like ventrally-directed prow and a forwardly-directed button as in the present species. Further, in *T. setosus*, notosetae are absent from more than half of the body length posteriorly, the peristomial ridge has many eye-spots and there are about 13 (Hartman 1956) to 20 (Monro 1936) ventral scutes.

Type specimens. Holotype, University of Ceylon, RTS. 24.
Paratypes. British Museum (Natural History).

Sub-family AMPHITRITINAE Hesse, 1917

Genus TEREbella Linnaeus, 1767

Terebella ehrenbergi Grube, 1870.

Terebella ehrenbergi Grube

Fauvel 1953, p. 421, Fig. 220, a—c; Imajima and Hartman 1964, p. 346.

Fourteen specimens, including one with a tube, were collected from the oyster farm at Binakayan, Cavite, Manila Bay. The longest specimen is 36.0 mm. long and 2.0 mm. wide. The smallest is 17.0 mm. long and 1.70 mm. wide. The tube is transparent and membranous.

These specimens agree fully with Fauvel's (1953) description and figures. The 13 ventral scutes are of equal length although from about the 10th they become narrow. Biserial uncini are regularly present from the 8th setiger.

Distribution: The Philippines, Japan, China Sea, Andamans, Gulf of Mannar, Inhaca Island, Red Sea.

Family SABELLIDAE Malmgren, 1867

Genus BRANCHIOMMA Kollicker, 1858

Branchiomma cingulata (Grube) 1870

Branchiomma cingulata (Grube)

Hartman 1959, p. 537; Imajima and Hartman 1964, p. 355.

Dasychone cingulata Grube

Willey 1905, p. 308; Fauvel 1932, p. 236; Fauvel 1958, p. 22; Fauvel 1953, p. 442; Okuda 1939, p. 242, Fig. 14.

Sabella (*Dasychone* M. Sars) *cingulata* Grube.

Grube 1878, p. 259, Taf. XIV, Fig. 6.

Numerous specimens were collected from the oyster farm at Manat, Dagupan City, Luzon. They were found growing abundantly on oyster shells and the bamboo spat collectors. Some specimens were also collected from the milkfish ponds in Bonuan, Zaragoza in the Lingayan Gulf, Luzon, and Zamboanga and Davao in Mindanao.

The gill radioles bear free slender stylodes and a series of paired dorsal eyes. All along the body there are characteristic eye spots between the dorsal and ventral setigerous rami. The tubes are thin, membranous and coated with fine particles of mud. Transverse ridges are present which are more prominent near the opening of the tube.

Distribution: The Philippines, Japan, Mergui, Burma, Andamans, Gulf of Mannar, Pamban, Ceylon, Indian and Pacific Oceans, Persian Gulf, Red Sea.

Genus **MEGALOMMA** Johansson, 1927

Megalomama intermedium (Beddard) 1889

Megalomma intermedium (Beddard)

Hartman 1959, p. 550.

Branchiomma intermedium Beddard

Fauvel 1953, p. 444, Fig. 234 e.

One large specimen was collected from Hundred Islands, Lingayan Gulf, Luzon, by Mr. Lichauco. It is 251.0 mm. long (including the gills) and 7.0 mm. wide in the anterior part of the thorax.

It agrees fully with Fauvel's (1953) description. With the discovery of this specimen the known size range of this species is increased by one and a half times. Fauvel (1953) states that they are 100 mm. long.

Distribution: The Philippines, Mergui Archipelago.

Genus **POTAMILLA** Malmgren, 1886

Potamilla oculea sp. nov.

(Fig. 21, B—H)

One complete specimen was collected from the oyster farm at Binakayan, Cavite, Manila Bay. It is 12.5 mm. long (including the gills) and 1.2 mm. wide in the region of the thorax. Its tube is membranous and coated with sand.

The branchiae are a little shorter than the thorax (Fig. 21, B). There are 12 gill radioles on each side arranged in a semicircle. They lack eyes and dorsal stylodes and end in short pinnule-free tips.

The collar is narrow, sloping backwards and ends in two triangular lobes ventrally. Many light orange eyes are present on the collar, ventrally.

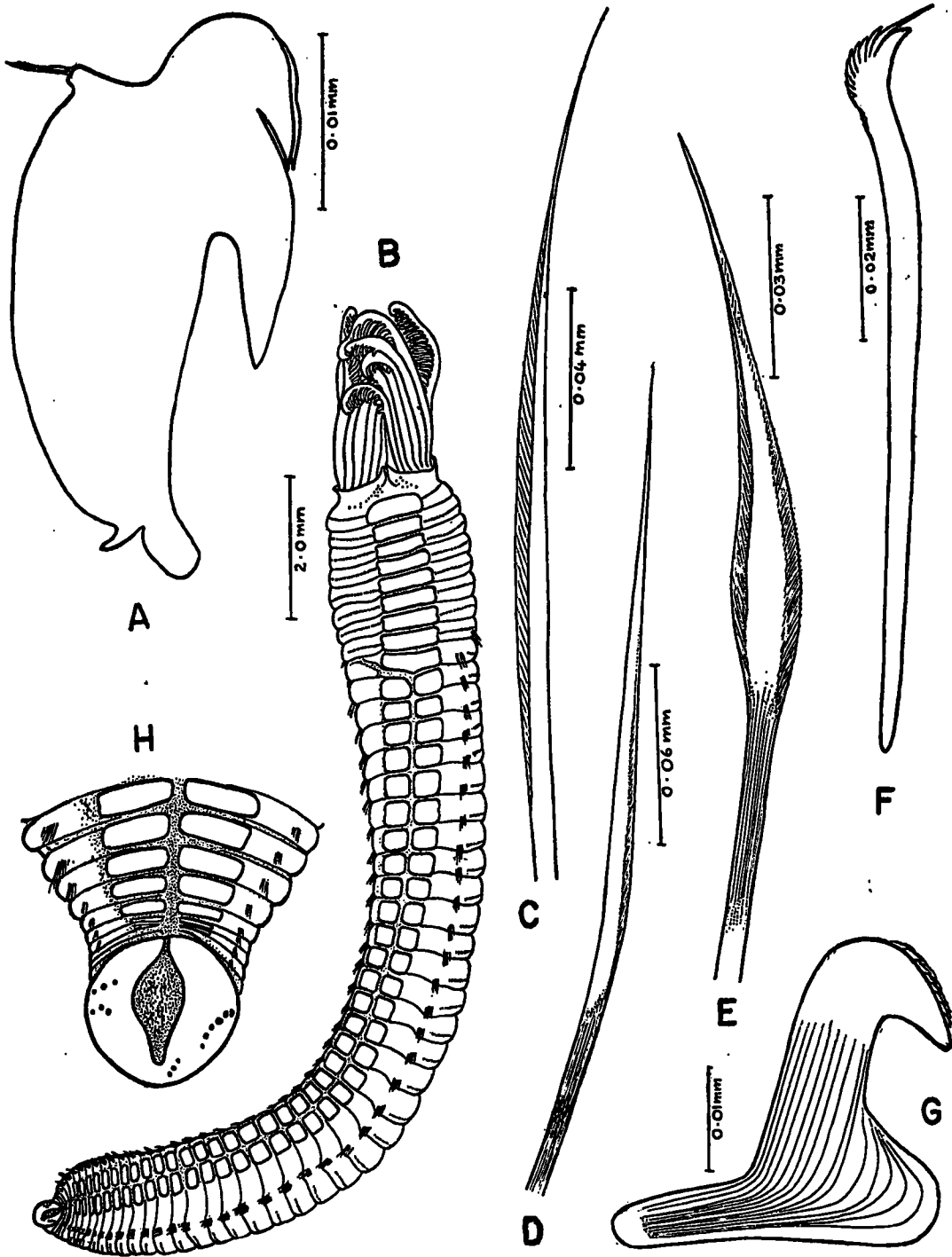


FIGURE 21. *Thelepus binakayanensis* sp. nov., A, An abdominal uncinus. *Potamilla oculea* sp. nov., B—H. B, Ventral view of the whole worm; C, Seta from the collar setal fascicle; D, Seta from the 3rd thoracic setal fascicle; E, Oar-shaped seta from the 3rd thoracic setal fascicle; F, Pick-axe shaped seta; G, Avicular uncinus; H, Ventral view of anal segment.

The thorax consists of 8 setigerous segments, the first being associated with the collar. A narrow longitudinal groove is present along the mid-dorsal line of the thorax and anterior abdomen. It commences between the gills of the two sides and ends on the 15th setiger.

Setae of the first setigerous segment are arranged in a tuft. They consist of only winged setae (Fig. 21, C). The remaining thoracic setal fascicles have setae of two kinds: (a) slender capillary setae with narrow wings (Fig. 21, D) and (b) paddle-shaped setae with serrated edges and tapering slender tips (Fig. 21, E).

Dorsal (thoracic) uncinigerous tori occur from the 2nd to the 8th setigerous segments. They bear pick-axe shaped setae and avicular uncini. The pick-axe shaped setae (Fig. 21, F) possess a long shaft and a serrated terminal portion. The penultimate denticle is long, slender and extends beyond the terminal tooth. Often this penultimate denticle is broken off. The avicular uncini (Fig. 21, G) have several teeth above the main fang.

The abdomen consists of about 38 well-developed setigers after which it narrows abruptly into a short formative region of about 5 narrow setigers and terminates in the anal segment. The abdominal notosetae do not possess such long tips as stated for *P. leptochaeta* Southern. The abdominal uncinigerous tori possess only avicular uncini, similar to those of the thorax.

There are 8 large rectangular ventral scutes in the thorax (Fig. 21, B). A similar scute is present on the first abdominal setiger also, after which there are two small nearly square scutes on each setiger with the mid-ventral faecal groove running in between them. The faecal groove turns right behind the first abdominal scute.

The anus is ventral. The anal segment bears anal eyes ventrally.

This species is closely related to *P. neglecta* (Sars) 1851, *P. casamancensis* Fauvel 1902, *P. leptochaeta* Southern 1921, *P. ceylonica* Augener 1926 and *P. brevithoracica* Pillai 1961 but possesses important characters by which it could be distinguished from them. Its gill radioles lack eyes but eyes are present on the collar and anal segment. Its thorax has 8 setigers and its thoracic and abdominal scutes are well developed, unlike in *P. leptochaeta* where they are very inconspicuous. The pick-axe shaped setae are different from those of the other species; the penultimate tooth is slender and elongated beyond the terminal fang. The gill radioles lack a membrane between their bases. The other five species mentioned do not possess eyes on the collar. Further, *P. leptochaeta* and *P. ceylonica* lack anal eyes, *P. brevithoracica* possesses 4 thoracic setigers and *P. leptochaeta* possesses 15–23 or more thoracic setigers, unlike in the present species.

Type specimen: Holotype. University of Ceylon, RTS. 25.

Family **SERPULIDAE** Savigny, 1818.

Genus **HYDROIDES** Gunnerus, 1768.

Hydroides grubei sp. nov.

(Fig. 22, A–G)

One specimen, without its tube, was collected from the oyster farm at Binakayan, Cavite, Manila Bay. It is 5.5 mm. long, 0.8 mm. wide in the thorax and 1.0 mm. wide in abdomen. The posterior tip of the latter is damaged.

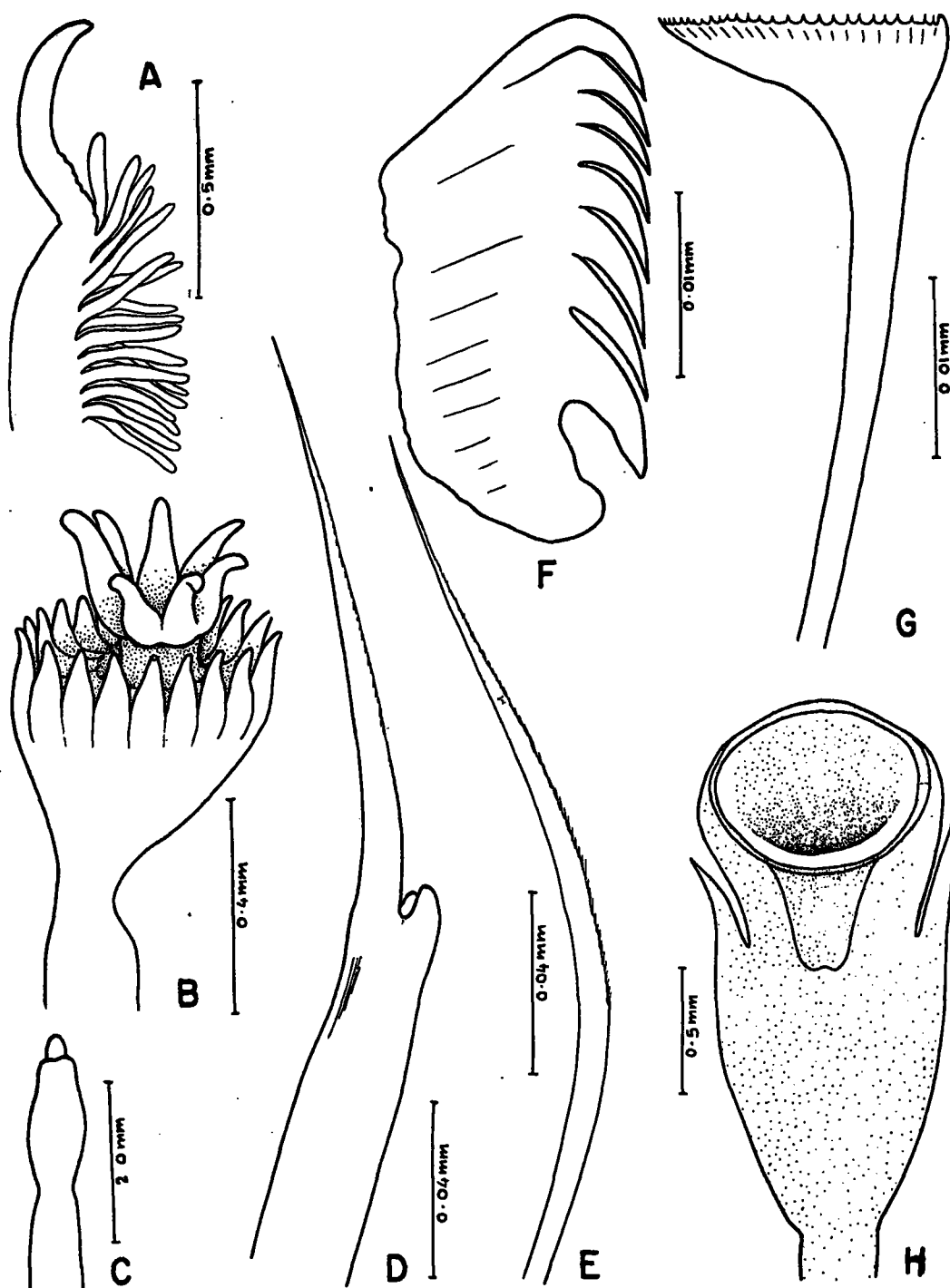


FIGURE 22. *Hydroides grubei* sp. nov., A—G. A, Tip of a gill; B, Operculum; C, Rudimentary operculum; D, Collar seta; E, Seta from the 2nd thoracic setal fascicle; F, Uncinus from the 2nd thoracic uncinigerous torus; G, Abdominal seta. *Pomatoleios kraussii* Baird var. *manilensis* nov., H, Dorsal view of the operculum.

There are 6 gill radioles and an operculum on the left side and 7 radioles and a rudimentary operculum on the right. Each gill ends in a stiff pinnule-free tip which is curved inwards (Fig. 22, A).

The operculum (Fig. 22, B) has a funnel-shaped proximal crown with 19 radii, each ending in a somewhat blunt outwardly directed marginal tooth. The distal crown consists of 7 blunt outwardly directed spines without any basal or lateral processes. The most dorsal spine is the largest although it is not much larger than those on either side of it. The rudimentary operculum has a shorter and narrower pedicle carrying a smooth toothless rudimentary basal funnel and a small knob-like spineless distal funnel (Fig. 22, C).

The collar is three-lobed. There is a broad mid-ventral lobe and a smaller lobe on either side of it associated with the thoracic membrane. The thoracic membranes of the two sides overlap over the dorsal thoracic wall. They become narrow in the region of the last two thoracic setigers and are continued behind the last pair of thoracic setigers as a ventral flap.

The bayonet-shaped collar setae (Fig. 22, D) possess two conical processes at the base of the blade. The remaining thoracic setae (Fig. 22, E) possess curved blades with fine serrations. Thoracic uncini (Fig. 22, F) possess 8 teeth of which the most anterior one is the largest. The abdominal uncini are similar in shape and bear the same number of teeth but they are about half as long as the thoracic uncini. The abdominal setae (Fig. 22, G) are trumpet-shaped and bear small pointed teeth, except for the end tooth of one side which is somewhat larger and blunt.

This species is similar to *Hydroides exaltata* (Marenzeller) 1884 and *H. inornata* Pillai 1960 in possessing 7 spines without lateral processes, in the distal crown of the operculum. However, in *H. exaltata*, unlike in the present species, the most dorsal (largest) spine curves inwards while the others point outwards and its thoracic uncini possess 6 teeth. In *H. inornata*, all 7 spines point inwards and the thoracic uncini possess 5 teeth.

Type specimen : Holotype. University of Ceylon, RTS. 26.

***Hydroides norvegica* Gunnerus 1768**

Hydroides norvegica Gunnerus

Fauvel 1953, p. 458, Fig. 241, i; Fauvel 1927, p. 356, Fig. 122, i -o; Pillai 1960, p. 12, Fig. 5, A -E; Pixell 1913, p. 74; Potts 1928, p. 700.

Several specimens were found in a plankton haul made from Manila Bay by Mr. Ernesto P. Bernabe of the Bureau of Fisheries, Dagat-dagatan, Malabon, Philippines. They had either been scraped off from the bottom substratum or from the bottom of the boat during the plankton haul.

Distribution: A widespread species. Atlantic Ocean, Mediterranean Sea, Red Sea, Persian Gulf, Indian Ocean, Indo-Pacific Region.

ANNELIDA POLYCHAETA

Genus **POMATOLEIOS** Pixell, 1913

Pomatoleios kraussii (Baird) 1864 var ***manilensis*** nov.
(Fig. 22, H)

Numerous specimens were collected from the oyster farm at Binakayan, Cavite, Manila Bay. They were found growing abundantly on and among the oysters.

These specimens agree in all respects, except one, with the several descriptions given for *P. crosslandi* Pixell 1913 (Fauvel 1953, Okuda 1937, Pillai 1960, Pixell 1913, etc.). None of the numerous specimens in the collection, most of which are sexually mature, possess a flat calcareous disk at the top of the operculum. Instead, all the specimens possess a funnel-shaped hollow with a calcareous lining (Fig. 22, H). This calcareous lining usually ends in two rounded knobs at the bottom of the funnel.

According to Pixell's (1913) generic definition of *Pomatoleios*, the operculum is flat and with a winged pedicle. Fauvel (1953) states that the operculum of the "Madras specimen is tipped with a hollow calcareous cup destitute of spines." Pillai (1960, p. 15 fig. 6 G) showed that the Ceylon form possesses a funnel-shaped hollow in the operculum in the young worm. This becomes shallower and, finally, a flat calcareous disk at the top as the worm gets older.

Pomatoleios reported from Japanese waters (Okuda 1937, Imajima and Hartman 1964) have flat opercula with a white calcareous plate. The material from Manila Bay appears to be a distinct variety of *P. kraussi* where the juvenile condition of the operculum is retained in the adult.

According to Okuda (1937), "Eye-spots may be absent or sometimes present. The specimens from Tomioka are usually destitute of eye-spots, while those from Seto and the present locality (Ishihama) bear 3-5 distinct pairs of dark blue eye-spots arranged in a longitudinal row on each lateral side of the filaments." Imajima and Hartman (1964) also state that eye-spots may or may not be present in specimens from Japanese waters. However, Pixell's original (1913) definition of *Pomatoleios* states that eye-spots are absent. The material from Manila Bay lacks eye-spots and eye-spots have not been described for the South African (Day 1934, 1951, 1955, 1962), Indian (Pixell 1913, Fauvel 1953) and Ceylon (Pillai 1960) forms.

According to Okuda (1937), "Japanese specimens have a rather large body and a greater number of branchial filaments. The occurrence of eye-spots in some Japanese specimens may fall within the variability of the species." However, it could also be possible that the Japanese material with eye-spots may be a distinct variety of *P. kraussii*.

The generic definition of *Pomatoleios* has now to take into account the condition of the tube (Fauvel 1932, Okuda 1937, Day 1951, Fauvel 1953 and Pillai 1960), the presence or absence of eye-spots (Okuda 1937, Imajima and Hartman 1964) and the condition of the operculum (Pixell 1913, Fauvel 1932, Okuda 1937, Fauvel 1953, Pillai 1960, Imajima and Hartman 1964, and the present material).

Hartman (1959, p. 587) considers that *P. crosslandi* Pixell 1913 and *P. kraussii* (Baird) 1865 are identical. Day, earlier (1955) studied Baird's type from Cape of Good Hope and Pixell's co-types from the Indian Ocean in the British Museum and proved them to be identical.

Type specimens : Lectotype and 3 Paratypes. University of Ceylon, RTS. 27.
Paratypes. British Museum (Natural History).

Sub-family FICOPOMATINAE Pillai, 1960

Genus NEOPOMATUS Pillai, 1960

Neopomatus uschakovi Pillai var. *lingayanensis* nov.
(Fig. 23, A – I)

Numerous specimens were collected from some bamboos lying in a shallow area of the Lingayan Gulf (Bongrin, Alaminos) Luzon. They were also observed on the sluices of milkfish ponds in the following places in the Philippines: Tambak (Zaragoza), Dagupan City, Dagat-dagatan and Malabon in Luzon; Iloilo, Cebu and Bacolod in the Visayas and Zamboanga and Davao in Mindanao.

Reddish or orange tubes were observed among white tubes. The largest specimen in this collection is 7.0 mm. long and 1.1 mm. wide.

All the numerous specimens examined from the Lingayan Gulf, Luzon, have their operculum on the left side. The maximum number of gill radioles observed is 8 plus the operculum on the left and 9 on the right, in 2 specimens. The numbers most commonly encountered are 7 plus the operculum on the left and 6, 7 or 8 on the right.

None of the specimens from the Lingayan Gulf lack denticulations on the operculum. About 44% have a single row of denticulations (Fig. 23, A); about 18% have 2 concentric rows (Fig. 23, B); 5% have 3 rows (Fig. 23, C); 7% have 4 rows (Fig. 23, D); 12% have 6 rows, 7% have 7 rows and the rest have 8 rows. The maximum number of rows of denticulations observed, in one specimen, is 9 (Fig. 23, E).

In a group of 21 worms collected from a submerged piece of bamboo, most of the specimens have more than 5 rows of denticulations in the operculum. Four specimens have 7 rows, 8 have 6 rows; 3 have 5, 1 has 3, another has 2 rows and 4 have 1 row. These specimens are of similar size and appear to be the progeny of parents with many rows of denticulations in their opercula.

About 65% of the specimens from the Lingayan Gulf have a crown of typically 3 spines at the top of the operculum, within the last ring of denticulations (Fig. 23, A – C). Occasionally, there are four, or less than 3, main spines. They are situated at the corners of a triangle with its base situated ventrally. The remaining 35% lack this central crown of spines and they all have 4 or more than 4 rows of denticulations. Thus only worms with 3 or less than 3 rows of denticulations possess the terminal crown of spines. A regenerating operculum with one row of denticulations also has this central crown of spines (Fig. 23, F).

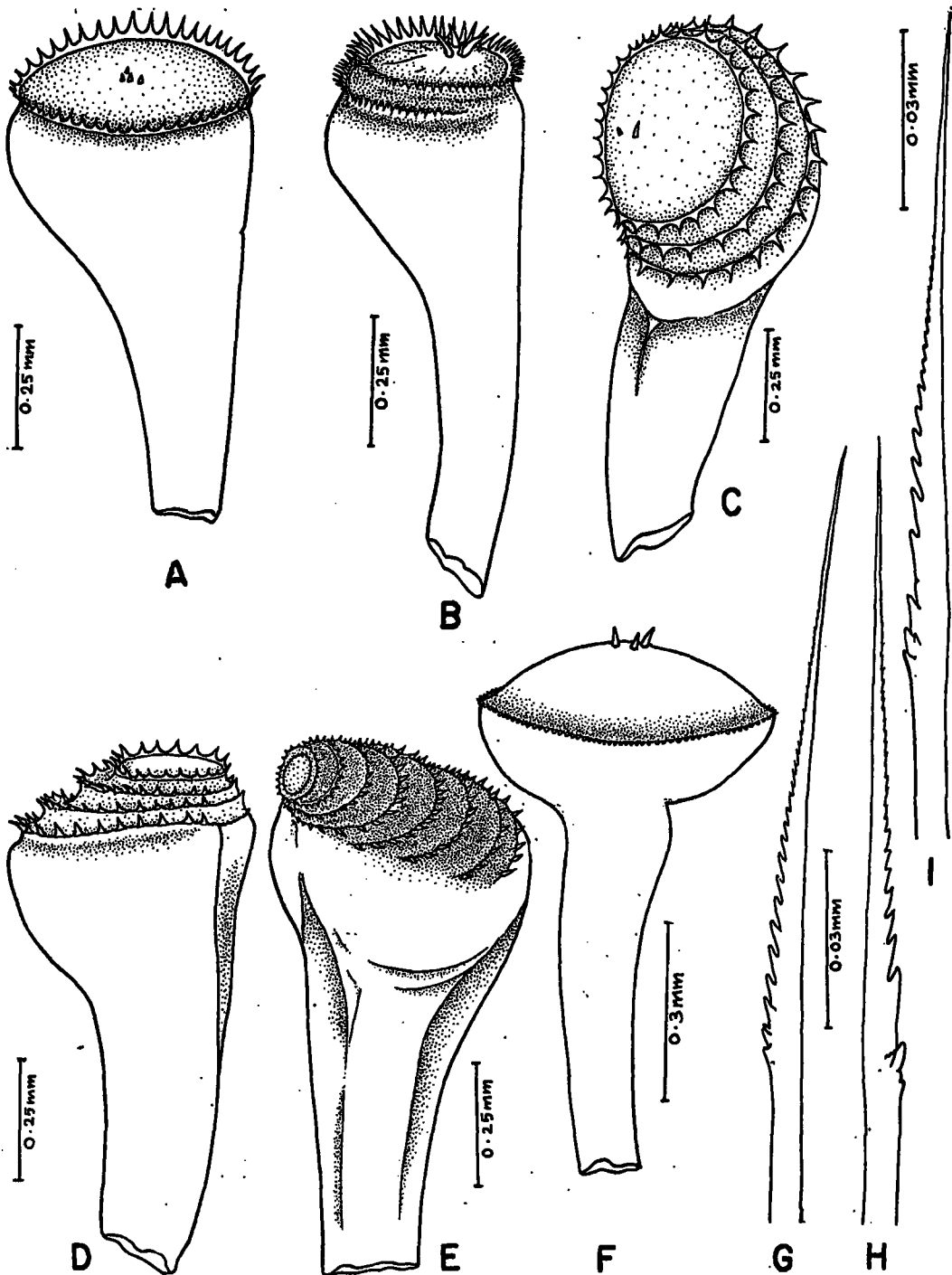


FIGURE 23. *Neopomatus uschakovi* Pillai var. *lingayanensis* nov., A—I. A, Operculum with a single ring of denticulations; B, An operculum with 2 concentric rows of denticulations; C, An operculum with 3 concentric rows of denticulations; D, An operculum with 4 concentric rows of denticulations; E, An operculum with 9 rows of denticulations; F, A regenerating operculum with a single row of denticulations; G—I. Different types of collar setae.

The Philippine specimens agree in other respects with *N. uschakovi* Pillai 1960 from Ceylon. Owing to the wide range of variations which now seem possible within this species it seems necessary to regard *N. similis* and *N. similis* var. *rugosus* as conspecific with *N. uschakovi*.

The populations of *Neopomatus* from the Lingayan Gulf, Luzon, however, constitute a distinct variety owing to their possession of the central crown of spines within the terminal circle of denticulations. They are different genetically from *Neopomatus* in Ceylon and East Java which do not possess this central crown of spines.

Type specimens : Lectotype and 5 Paratypes, University of Ceylon, RTS. 28.
Paratypes. British Museum (Natural History).

***Neopomatus uschakovi* Pillai, 1960**

Fourteen specimens were found growing on a Palaemonid prawn *Macrobrachium rosenbergi* obtained from a fish market in Surabaya, East Java. They were also found growing abundantly on the submerged parts of wooden sluices and bamboo structures in several brackish-water milkfish ponds in East Java and the island of Madura. A predominance of white tubes was noticed everywhere and orange or light red tubes were found mixed with them.

These specimens agree with the description for *N. uschakovi*. None of them have the central crown of spines characteristic of the material from the Lingayan Gulf, Luzon.

Distribution. Ceylon, Java, Madura.

Sub-family SPIRORBINAE Chamberlin, 1919

Genus SPIRORBIS Daudin, 1800

(Dexiospira Caullery and Mesnil, 1897)

***Spirorbis (Dexiospira) treadwelli* sp. nov.**

(Fig. 24, A – E)

Several specimens were collected from the vicinity of the Pangasinan School of Fisheries, Lucop, Alaminos, Luzon. They were found growing abundantly on stones and other hard objects lying in the channels which supply tidal water to the fish ponds in the vicinity. This species appears to be capable of enduring brief periods of intertidal exposure since tubes with worms in them were collected from the stones left exposed towards the end of the low-tide period.

The tube (Fig. 24, A) is dextral and bears three longitudinal ridges. The innermost ridge runs along the inner border of the tube. Towards the aperture of the tube, the distance between the innermost and median ridge is equal to that between the latter and the outermost ridge. The distance between the outermost ridge and the outer border of the

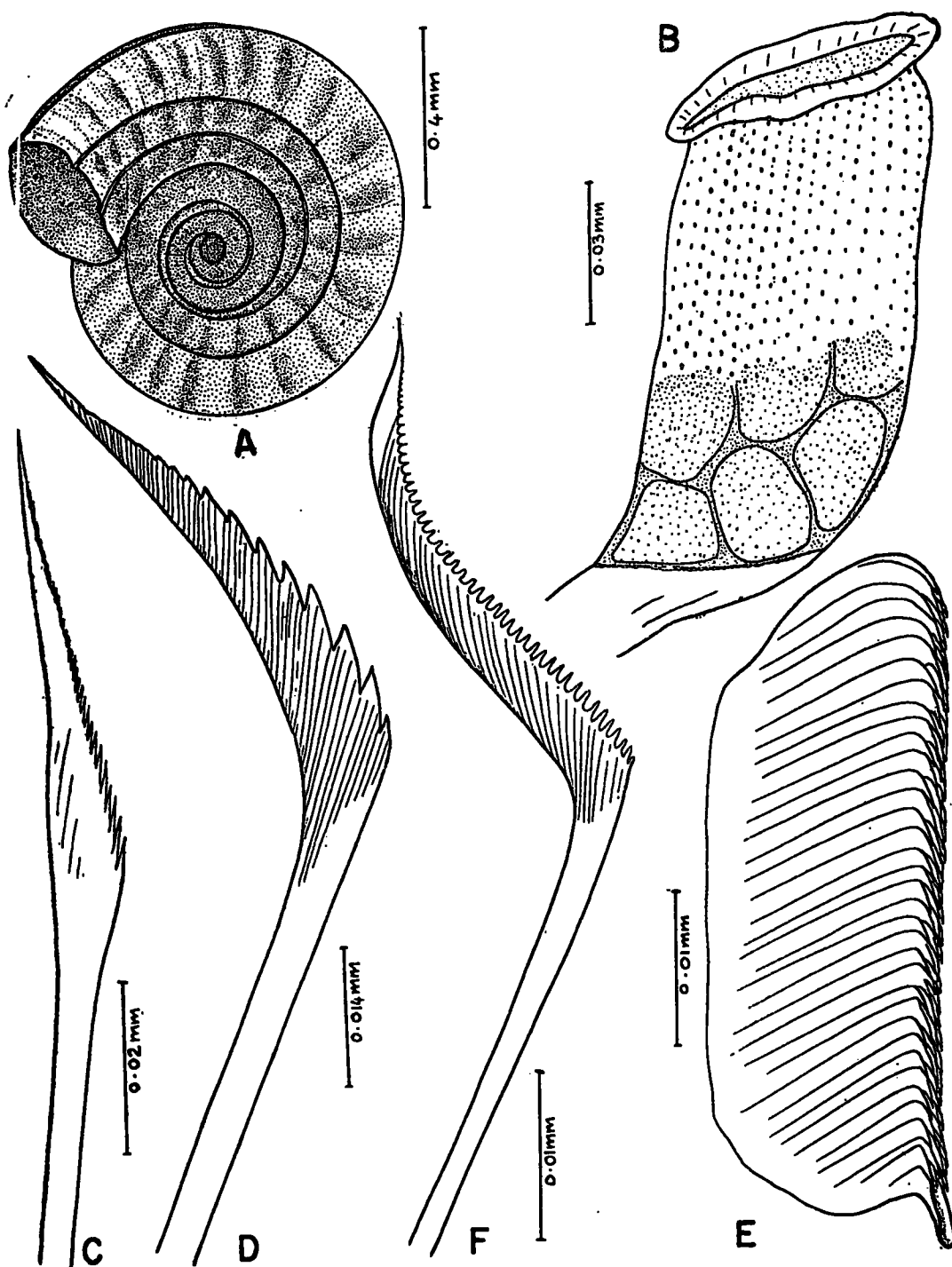


FIGURE 24. *Spirorbis (Dexiospira) treadwelli* sp. nov., A—E. A, Tube; B, Operculum; C, Seta from the collar setal fascicle on the inside of the spiral; D, Collar seta from the fascicle on the outside of the spiral; E, Thoracic uncinus; F, Abdominal seta.

tube is about twice that between the outer and median ridges. The outer border of the tube is expanded into a narrow flange which spreads over the surface of attachment. The surface of the tube is faintly pitted in three longitudinal rows, one between the innermost and median ridges, the second between the median and outer ridges and the third outside the outermost ridge.

There are altogether 7 gills. The operculum (Fig. 24, B) is a cylindrical brood pouch crowned with a collar-like rim. In its proximal third the wall is transparent, while in the remaining distal portion the wall is opaque. The latter is impregnated with white calcareous material and has minute apertures arranged in longitudinal rows.

The thorax consists of 3 setigerous segments. Typical collar setae occur asymmetrically. They are absent in the collar setal fascicle on the inside of the spiral, but are present on the opposite side. The setal fascicle on the inside of the spiral possesses only setae with a single row of slender serrations (Fig. 24, C). The other collar setal fascicle has typical collar setae mixed with setae having slender serrations. The collar setae (Fig. 24, D), which number about 3, have very long shafts and curved striated blades bearing 8–11 stout teeth which decrease in size towards the tip. They are devoid of separate fin-like portions. Setae of the remaining thoracic fascicles also have slender serrations (Fig. 24, C). Thoracic uncini (Fig. 24, E) are nearly thrice as long as broad and bear 4–5 longitudinal rows of teeth and a single anterior gouged process.

The abdomen has about 12 segments in older specimens. Abdominal setae are present in the posterior nine segments or so. They are geniculate and their blades are falciform and serrated (Fig. 24, F).

This species is similar in some respects to *S. foraminosus* Bush 1904, *S. ceylonicus* Pillai 1960, *S. alveolatus* Zachs 1933, and *S. nipponicus* Okuda 1934. All have three longitudinal ridges on the tube which is also pitted, a cylindrical operculum with a rim at the top, and lack a fin-like process on the collar setae.

S. foraminosus which was adequately described only recently (Day 1961) has only smooth to pilose collar setae, and its uncini have about 5 longitudinal rows of teeth and end in a 3- or 5-fid gouge. In *S. ceylonicus*, the collar setae have large rounded teeth and the uncini have a single row of teeth and end anteriorly in a single process. The distances between the ridges on the tube are also different.

In *S. alveolatus*, collar setae are moderately bent and with minutely serrated blades. The uncini have 4 or 5 longitudinal rows of teeth and end anteriorly in a trifid process (Imajima and Hartman 1964). The differences between *S. alveolatus* and *S. foraminosus* are very slight. Both are also found on algae (Imajima and Hartman 1964, Day 1961.).

S. nipponicus, like *S. foraminosus* and *S. alveolatus*, and unlike the present species, has thoracic uncini with 4 or 5 longitudinal rows of many fine teeth and terminate in a trifid process; the collar fascicle bears setae with minutely serrated blades and few slender capillary setae. It is also commonly found fixed on seaweeds. According to Okuda (1937): "The species is closely allied to *Spirorbis foraminosus*, but only different from the latter in the trifurcated basal processes and the operculum without a longitudinal grated

plate." As stated earlier, Day (1961) showed that the uncini of *S. foraminosus* end in a 3- or 5-fid gouge. Imajima and Hartman (1964) consider *S. alveolatus* and *S. nipponicus* as synonymous. It appears now that these two may be synonymous with *S. foraminosus*.

Type specimens : Lectotype and 5 Paratypes. University of Ceylon, RTS. 29.
Paratypes, British Museum (Natural History).

REFERENCES

- ABBOT, D. P. JR. 1946. Some polychaetous annelids from a Hawaiian fish pond. *Univ. Hawaii Res. Publ.*, No. 23, pp. 5—24.
- AUGENER, H. 1906. Westindische Polychaeten, *Bull. Mus. Comp. Zool. Harvard*. Vol. 43, pp. 91—196.
1926. Ceylon Polychaeten. *Jen. Zeitschr. Naturwiss.*, Vol. 62, pp. 435—472.
- CHAMBERLIN, R. V. 1919. The Annelida Polychaeta. *Mem. Mus. Comp. Zool. Harvard*. Vol. XLVIII, pp. 1—514, pls. 1—LXXX.
- DAY, J. H. 1934. On a collection of South African Polychaeta with a catalogue of the species recorded from South Africa, Angola, Mozambique and Madagascar. *J. Linn. Soc. Lond.* Vol. 39, No. 263, pp. 15—82.
1951. The polychaet Fauna of South Africa, Part 1. The intertidal and estuarine polychaeta of Natal and Mozambique. *Ann. Natal. Mus.*, 12, pp. 1—67.
1955. Polychaeta of South Africa. Part 3. Sedentary species from Cape shores and estuaries. *J. Linn. Soc. Lond. Zool.* Vol. XLII, No. 287, pp. 407—452.
1957. The Polychaet Fauna of South Africa. Part 4. New species and records from Natal and Mozambique. *Ann. Natal. Mus.* Vol. XIV, Part I, pp. 59—129.
1961. The Polychaet Fauna of South Africa. Part 6. Sedentary species dredged off Cape coasts with a few new records from the shore. *J. Lin. Soc. Lond.* Vol. 44, No. 299, pp. 464—560.
1962. Polychaeta from several localities in the Western Indian Ocean. *Proc. Zool. Soc. Lond.* Vol. 139, Pt. 4, pp. 627—656.
1963. The Polychaet Fauna of South Africa. Part 8. New species and records from grab samples and dredgings. *Bull. British Mus. (Nat. Hist.)*, *Zool.* Vol. 10, No. 7, pp. 383—445.
- DE SILVA, P. H. D. H. 1961. Contributions to the knowledge of the polychaete fauna of Ceylon. Part I. Five new species, two new varieties and several new records principally from the Southern Coast. *Spolia Zeylanica*. Vol. 29, Pt. 11, pp. 164—194.
1965 New species and records of Polychaeta from Ceylon. *Proc. Zool. Soc. Lond.* Vol. 144, (in Press).
- FAUVEL, P. 1919.—Annélides Polychètes de Madagascar, de Djibouti. *Arch. Zool. Experim. et Generale*. Tome 58, p. 315 à 473, pl. XV à XVII.
1923. Polychètes Errantes. *Faune de France*. Vol. V, pp. 1—488.
1927. Polychètes Sédentaires. *Faune de France*. Vol. XVI, pp. 1—494.
1930. Annelida Polychaeta of the Madras Government Museum. *Bull. Madras Govt. Mus. (N.S.)*, *Nat. Hist. Sec.* Vol. 1, No. 2, Pt. 1, pp. 1—72.
1932. Annelida Polychaeta of the Indian Museum, Calcutta. *Mem. Ind. Mus.*, XII, No. 1, pp. 1—262, pls. 1—IX.
1953. The Fauna of India, including Pakistan, Ceylon, Burma and Malaya. Annelida Polychaeta. *The Indian Press, Allahabad*. pp. 1—507.
1958. Sur quelques annélides polychètes du Golfe D'Akaba. II. *Bull. State of Israel. Min. Agric.* No. 16, pp. 15—22.
- GEE, J. M. 1964. The British spirorbinae (Polychaeta: Serpulidae) with a description of *Spirorbis cuneatus* sp.n. and a review of the genus *Spirorbis*. *Proc. Zool. Soc. Lond.* Vol. 143, Pt. 3, pp. 405—441.
- GRAVIER, CH. 1908—1910. Deuxième Expédition Antartique Française (1908—1910). Annélides Polychètes pp. 1—165, Pls. 1—XII.
- GRUBE, ED. 1878. Annulata Semperiana. Beiträge zur Kenntnis der Anneliden—Fauna der Philippinen nach den von Herrn Prof. Semper mitgebrachten Sammlungen. *Mem. Acad. Imp. Sci. St. Petersburg* (7), XXV, pp. 1—300, pls. 1—XV.

- HOAGLAND, R. A. 1919. Polychaetous Annelids from Porto Rico, the Florida Keys and Bermuda. *Bull. Amer. Mus. Nat. Hist.* Vol. XLI, pp. 571—590.
- HARTMAN, O. 1956. Polychaetous annelids erected by Treadwell, 1891—1948, together with a brief chronology. *Bull. Amer. Mus. Nat. Hist.* Vol. 109, Art. 2. pp. 239—310.
1959. Capitellidae and Nereidae (marine Annelids) from the Gulf side of Florida with a review of freshwater Nereidae. *Bull. Mar. Sci. Gulf and Caribbean.* Vol. 9, No. 2, pp. 153—168.
1959. Catalogue of the Polychaetous Annelids of the world. *Allan Hancock Foundation Publ. Occ. paper* No. 23, Pts. I & II, pp. 1—628.
1961. Polychaetous Annelids from California. *Allan Hancock Pacific Expeditions.* Vol. 25, pp. 1—226.
1964. Polychaeta Errantia of Antarctica. Amer. Geophysical Union of the Nat. Acad. Sci.—N.R.C. Publ. No. 1226. Contrib. No. 263 of the *Allan Hancock Foundation*.
- IMAJIMA, M. AND HARTMAN, O. 1964. The polychaetous annelids of Japan, Parts I & II. *Allan Hancock Foundn. Publ. Occ. paper.* No. 26, pp. 1—452.
- M'INTOSH, W. C. 1885. Report on the Annelida Polychaeta collected by the H.M.S. Challenger during the years 1873—76. *Challenger Exped. Reports.* Vol. XII, pp. 1—554.
- MONRO, C. C. A. 1924. On the Polychaeta collected by H.M.S. "Alert," 1878—1882. Families Aphroditidae and Amphinomidae. *J. Linn. Soc. Lond. (Zool.).* Vol. 36, No. 240, pp. 65—77.
1931. Polychaeta, Oligochaeta, Echiuridea and Sipunculidea. (Great Barrier Reef Expedition) *Scientific Reports*, IV. No. 1, pp. 1—37.
1931. The Polychaeta. *Discovery Reports.* Vol. II, pp. 1—222.
1933. The Polychaeta Errantia collected by Dr. C. Crossland at Colon, in the Panama Region and the Galapagos Islands during the Expedition of the S. Y. "St. George." *Proc. Gen. meetings Zool. Soc. Lond.* pp. 1—96.
1936. The Polychaeta. *Discovery Reports.* Vol. XII, pp. 59—198.
1937. The polychaeta collected during the John Murray Expedition 1933—34. *Scientific Reports.* B.M. (N.H.). Vol. IV, Zoology. pp. 243—321.
- OKUDA, S. 1934. Some tubicolous annelids from Hokkaido. *J. Fac. Sci. Hokkaido Imp. Univ. Sapporo.* Vol. 3, Ser. 6, pp. 233—246.
- 1937a. Spioniform polychaetes from Japan. *J. Fac. Sci. Hokkaido Imp. Univ. Sapporo.* Vol. 5 Ser. 6, pp. 217—254.
- 1937b. Annelida Polychaeta in Onagawa Bay and its vicinity. I. Polychaeta Sedentaria. *Sci. Rep. Tohoku Imp. Univ.* Vol. 12, Ser. 4, No. 1, pp. 45—69.
1939. Annelida Polychaeta in Onagawa Bay and its vicinity. II. Polychaeta Errantia, with some addenda for Polychaeta sedentaria. *Sci. Rep. Tohoku Imp. Univ.* Vol. 14, pp. 219—244.
- OKUDA, S. AND YAMADA, M. 1954. Polychaetous annelids from Matsushima Bay. *J. Fac. Sci. Hokkaido Univ.,* Vol. 12, pp. 175—199.
- PETTIBONE MARIAN, H. 1954. Marine Polychaeta from Point Barrow, Alaska, with additional records from the North Atlantic and North Pacific. *Proc. U.S. Nat. Mus.* No. 3324. Vol. 103, pp. 203—356.
- PILLAI, T. G. 1958. Studies on a brackish-water polychaetous annelid, *Marphysa borradalei*, sp. n. from Ceylon. *Ceylon J. Sci., (Bio. Sci.)* Vol. 1, No. 2, pp. 94—106.
1960. Some Marine and Brackish-water Serpulid Polychaeta from Ceylon, Including New Genera and Species. *Ceylon J. Sci. (Bio. Sci.),* Vol. 3, No. 1, pp. 1—40.
1961. Annelida Polychaeta of Tambalagam Lake, Ceylon. *Ceylon J. Sci. (Bio. Sci.),* Vol. 4, No. 1, pp. 1—40.
1962. Fish Farming Methods in the Philippines, Indonesia and Hong Kong. *F.A.O. Fisheries Biol. Tech. Pap.* No. 18, pp. 1—68 (Distribution restricted).
- PIXELL, H. L. M. 1913. Polychaeta of the Indian Ocean, together with some species from the Cape Verde Islands. The Serpulidae, with a classification of the genera *Hydroides* and *Eupomatus*. *Trans. Linn. Soc. Lond. (Zool.).* XVI, pp. 69—92, pls. VIII—IX.
- POTTS, F. A. 1909—10. Polychaeta of the Indian Ocean. Part I. The Amphinomidae. *Trans. Linn. Soc. Lond. (Zool.).* 2nd Ser. XII, pp. 355—371, pls. XLV—XLVII.
- RIOJA, E. 1954. Estudios Annelidológicos XXII. Datos para el conocimiento de la fauna de anélidos poliquetos de las Costas orientales de Mexico. *Anales del Inst. de Biol. Mexico.* Tomo XXIX, pp. 219—301.
- SOUTHERN, R. 1921. Polychaeta of the Chilka Lake, and also of fresh and brackish waters in other parts of India. *Mem. Ind. Mus.* Vol. V, pp. 563—59.

- TEBBLE, N. 1955. The Polychaet Fauna of the Gold Coast. *Bull. British Mus. (Nat. Hist.) Zool.* Vol. 3, No. 2, pp. 61—148.
1959. On a collection of Polychaetes from the Mediterranean coast of Israel. *Bull. Res. Council. Israel, Sec. B. Zool.* Vol. B 8, No. 1, pp. 9—30.
- TREADWELL, A. L. 1920. Polychaetous Annelids collected by the U.S. Fisheries steamer "Albatross" in the waters adjacent to the Philippine Islands in 1907—190. *Smith. Inst. U.S. Nat. Mus. Bull.* C. I. pt. 8. pp. 589—602.
1942. Polychaetous Annelids from Lower California and the Philippine Islands in the Collections of the American Museum of Natural History. *Amer. Mus. Novitates.* pp. 1—5.
1943. Polychaetous annelids from the Philippine Islands in the collections of the American Museum of Natural History. *Amer. Mus. Novitates.* No. pp. 1—4.
- WILLEY, A. 1905. Report on the Polychaeta collected by Professor Herdman at Ceylon. *Ceylon Pearl Oyster Fish. Rept.* No. XXX, *Ray Soc. Lond.* pp. 312—319.
- WOODWICK, K. H. 1953. *Polydora nuchalis*, a new species of polychaetous annelid from California, *J. Wash Acad. Sci.* Vol. 43, No. 11, pp. 381—383.
1961. *Polydora rikettsi*, a new species of spionid polychaete from lower California. *Pacific Science.* Vol. XV, No. 1. pp.
1963. Taxonomic revision of two Polydoridae species (Annelida, Polychaeta, Spionidae). *Proc. Wash. Biol. Soc. Wash.* Vol. 76, pp. 209—216.
1964. *Polydora* and related Genera (Annelida, Polychaeta) from Eniwetok, Majuro, and Bikini Atolls, Marshall Islands. *Pacific Science.* Vol. XVIII, No. 2. pp.

(MS. received 12.2.65)

